ROLE OF REGULATED MARKETS IN AGRICULTURAL DEVELOPMENT IN ALIGARH

ABSTRACT
THESIS

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BY

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ABSTRACT
ROLE OF REGULATED MARKETS IN AGRICULTURAL DEVELOPMENT IN ALIGARH

Regulated markets occupy an important place in the contemporary agricultural marketing scenario of India. Up to late 60's, regulated market has little importance in the country but today these markets has emerged as the most powerful instrument to revamp and radicalize the age old and traditional-bound system of agricultural marketing in India. The advent of regulated markets has undoubtedly helped in mitigating the market handicaps of producer sellers by releasing them from monopolistic power of village traders. In addition to this protective function, the regulatory apparatus has also helped in making the marketing system more efficient

The traditional system of agricultural marketing in India was not healthy because it was completely a trader oriented system with prevalence of high marketing cost, unauthorized deductions of marketing charges and other malpractices. Further, relatively larger margin of middlemen in the consumer's price of various agro-products was a common feature, which reflects exploitative nature of agricultural marketing. Large seasonal fluctuations in arrivals and pricing of agricultural products was another expression of an inefficient marketing system. Since the beginning of our civilization farmers remains deprived, weak and unorganized. Therefore, they are subjected to exploitation by numerically small but economically strong and well-organized traders and middlemen. In order to check the exploitation of farmers and to make the marketing system more effective and efficient, government has established regulated markets.

Regulated market is a place where producers, sellers, traders, middlemen, market administrators and workers assemble for the marketing of agricultural products in order to fulfill the demands of our society. The main works of markets are to provide better prices to the farmers and availability of agricultural commodities to the consumers and food processing industries at reasonable rates. Besides these facilities, creation of basic infrastructure for development of modern marketing system is imperative for strengthening the competitiveness of Indian agriculture in the global market.

Regulated market has immense potential to help not only to the rural people but also to the entire spectrum of market users in both rural and urban centres. It is a cardinal point in the nation's distribution of surplus agricultural produce. The process of economic development in rural areas, through regulated market is like that the surplus

agricultural produce arrives at this wholesale terminal market, directly through the village producers or through primary and secondary markets in hierarchical pattern. It provides the facility of grading, standardization and quality control measures, ancillary facilities, construction of rural link roads, and diffusion of agricultural innovations etc., which give impetus for increasing the agricultural productivity. Consequently, more surplus income is generated, which may be reinvested in agricultural inputs and may place more demands for exotic goods and services in rural areas.

These market centers are playing a very important role in decision making of the farmers to cultivate different kind of crops in their market hinterland on the one hand and maintaining a link between mandi and its' hinterland. Dependency on the *mandi* to sell agro-commodities is determined by the distance from the villages and the categories of the farmers. Other factors like access and mode of transport also influence the farmer's decision to sell their commodities in these market centers. Therefore, theoretically the zone of maximum arrival intensity should occupy nearest position to the mandi center and varies inversely with the distance. Moreover, the farmer who has his fields near the mandi will pay less transport expenses than one who is at some distance. The difference in the saving transport per acre will be the economic rent. Economic rent decreases as the distance from the market increases. It is thus obvious that farmers of small size of land holding will not come to the market from far distances than the big farmers. This results small size of the farmers frequently will come to the market from nearby market area. Because, these market centers are playing very important role in the commercialization of agriculture and the direct beneficiary of these markets are their hinterland farmers. It (mandi) would be considered as the most important indicator for the development of agrarian economy like India.

Therefore, regulated markets are important means to increase the income of farmers and level of consumer's satisfaction. The farmers allocate their resources according to their comparative advantage and invest modern inputs to obtain higher productivity and production. This in turn contributes to increased marketed surplus of farm products and resulting agricultural development.

The topic selected for the research work is important for both academic and planning purpose. Academically, it would help in creating new insight to understand what role is being played by regulated market in the development of agriculture. On the other hand at policy level it would generate the accurate data to understand the existing problems in the regulated markets.

The present research work can play a vital role in formulating the policies for the development of agriculture through the regulated markets. The district Aligarh has been selected as the study area. Agriculturally Aligarh district is one of the developed districts of western Uttar Pradesh as this district is the witness of Green Revolution[1]. Majority of the people in the district are engaged in agricultural activities. Therefore rural population of the study area is depends on efficient marketing system for the sale and purchase of agro-commodities. The regulated markets provide all the necessary facilities for the efficient movement of agro-commodities from the producers to the consumers. The transaction through the regulated markets are contributing significantly in enhancing the income of farmers which leads agricultural development in the study area.

Thus regulated markets and its role in agricultural development is important aspect of marketing geography. An understanding of these factors of the study area will provide empirical evidences for the planners and the policy makers to formulate policies which shall be helpful in agricultural development.

Taking into consideration the aforesaid conditions and features of Indian agriculture with reference to marketing, following objectives have been formulated:

1. To find out the nature and mechanism of agro-marketing and facilities and amenities in the regulated markets of the study area.
2. To estimate the trend and pattern of temporal variation in primary and secondary arrival as well as seasonal primary arrival of agro-commodities.
3. To assess the proportion of market arrival intensity of different agricultural commodities from the market hinterland.
4. To assess the number and proportion of producer sellers of various size of land holdings coming to the regulated markets.
5. To understand the variables which are plying important role in agricultural development through marketing of surplus agro-commodities.
6. To suggest remedial measures for better regulated market, which will help in agricultural development of the study area.

For achieving the success in understanding the discussed objectives, some hypotheses would also be tested. These hypotheses are given below:

1. Positive market arrival is one of the performance variables of the regulated market.
2. Seasonal fluctuations in the arrivals of agro-commodities in the regulated markets are pronounced.

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[1] Government of India has initiated a policy to increase food production in some district in the country by using modern technology during late 1960 s.

3. Efficient transportation and other infrastructural facilities reduce spatial unevenness of marketed surplus.
4. Highest market arrival intensity zone and proportion of marketed surplus of agro-commodities are closest to the market centres. It is inversely related with the distance from the market.
5. The number of sellers and frequency of their visit to market decreases as the distance increases from the market centres.
6. There is positive relation between regulated market and agricultural development.

The study is based on both primary and secondary source of data. Primary data have been generated from two tier of geographical locations i.e., regulated markets and its hinterland villages. The hinterland region of each regulated market is divided into different concentric zones based on distance of 2 kilometres apart. Three villages from each concentric zone have been selected for detailed enquiry. Fifteen villages have been selected around each regulated market notified area on the basis of stratified random sampling technique. Thus total sixty villages have been selected keeping in view some special considerations viz, road connectivity and the interior location around regulated markets of the Aligarh district.

Further 10 per cent of producer sellers and traders from each regulated markets and fifty households from every sampled village have been selected on the basis of stratified random sampling. Data was collected in 2004-2005 on the basis of detailed questionnaire. Villagers have been thoroughly interviewed regarding various aspects of regulated markets and its impact on agriculture development. All the sampled villages were visited before conducting survey. In this preliminary survey, list of households was prepared and village inhabitants were classified on the basis of size of land holdings, i.e. marginal, small, medium, big and very big farmers. Keeping in view total 50 households from each village, belonging to different categories according to size of land holding were selected in the proportion.

The data regarding the arrival of agro-commodities have been collected from the agricultural market committee of each regulated market, which keeps the regular records of daily, weekly, monthly and annual arrival of agricultural products.

Only nine major crops namely paddy, wheat, maize, arhar, moong, mustard, groundnut, potato and onion have been taken into consideration. The crops were selected on the basis of production and the quantity reached in the market. In addition to primary data, secondary data have been collected from Census Office Lucknow, District

Statistical Office Aligarh, The Directorate of Marketing and Inspection Faridabad, District Industry Office Aligarh.

The collected data was analyzed by using different statistical techniques like simple percentage, Weaver's Crop Combination region, Karl Pearson's Coefficient of Correlation to derive conclusions regarding the role of regulated markets in the development of agriculture.

Aligarh district is selected as study area because it is agriculturally development district of Western Uttar Pradesh and the district has been selected for green revolution during their initial phase. The study area is located in upper Ganga Yamuna *doab.* It lies between 27° 34′ N to 28° 11′ N latitudes and 77° 29′ E to 78° 38′ E longitudes, covering an area of 3691.54 sq. kms and inhabitating 2992286 persons (2001).

The district is well served by regulated markets and becomes one of the important marketing channels for agro-marketing. Agriculture is practiced intensively securing 168.93 per cent cropping intensity index. Intensive and extensive farming are done on 481619 hectares of land.

Aligarh is divided into 5 sub-divisions and 12 developmental blocks. The district has 1181 villages and 13 towns. The district has 4 regulated markets and 6 sub-markets regulated.

The present research work unfolds various aspects of regulated markets of Aligarh district both in term of time and space. The study has been divided into seven chapters.

First chapter deals with the statement of the problem, significance of the study, objectives, hypotheses, methodology of research and data collection, study area and review of literature.

Second chapter examines the geographical outlook of the study area. It deals with physical conditions, demographic characteristics, agricultural and non-agricultural economy of the study area. The study area embodies a distinct geographical personality in terms of physical and socio-economic conditions. These geographical factors are responsible for reshaping and designing the geographical landscape.

Third chapter deals with the over all view of regulated agricultural marketing i.e., their need, important features, objectives, significance, historical background. Besides, it also deals with administrative organization, composition and organization of market committee, infrastructural facilities, notified commodities and site of the regulated markets.

Fourth chapter describes the system of regulated markets in the study area. This chapter analyzes location and distribution of regulated markets, proportion of marketed surplus of different crops marketed through different agencies of agricultural marketing system, method of transaction of agricultural products, market functionaries, marketing channels of the agricultural products, infrastructural facilities and trading premises.

Fifth chapter discussed the role of regulated markets of the study area. This chapter is mainly devoted to the study of trends and patterns of market arrival in spatio-temporal dimensions of the regulated markets of Aligarh district. The volume of business transacted and its character is the important indicator for assessing the role of regulated market. In this chapter an attempt has been made to examine the behaviour of arrivals in the regulated markets of the study area.

Sixth chapter examines the market arrival intensity and proportion of marketed surplus in regulated markets from different zones of market hinterland. And try to estimate the number of producer sellers coming from different zones according to the size of land holdings in different regulated markets.

Seventh chapter assesses the role of regulated market in agricultural development with reference to area, production and yield of different crops for a period of 12 years from 1991-92 to 2002-2003. In this chapter an effort has been made to understand the factors which are crucial in agricultural development. Moreover, relation between the market and agricultural development variables have been examined to understand the role being played by the regulated markets in agricultural development of the district using Karl Pearson's Coefficient of Correlation.

In the last conclusion and summarizes main findings of the study and highlights its importance for further research. However, some important suggestions for improvement of agricultural marketing system in regulated markets of Aligarh district have also been made.

It is realized through the study that efficient marketing enables the farmers to grow more agro-commodities from subsistence/semi-subsistence to market oriented. With the passage of time agro-marketing provides incentives to the farmers to grow farm produce for export. Therefore, streamlined movement of the producers' surplus through the regulated markets to the consumers would raise the income level of the farmers and promote the agriculture development and economic development of the study area.

The two tier analysis of agricultural marketing in Aligarh district provides some insight about their relative importance and role in the agricultural development. The

proportion of marketed surplus of agro-commodities at village level, and in regulated markets indicates towards the level of agro-marketing and their effects on the development of agriculture in the district. The study highlights that the modernization, efficiency and vigour of agro-marketing is positively dependent upon the uniformity of marketing practices, uniform regulatory provisions, accessibility to bigger market centers, reduction of market margins and of course on post-harvest storage facilities.

Thus as a generalized statement, it can be argued that structural changes in farming practice and marketing of agro-commodities would lead to effective integration of market centers. These market centers under uniform regulatory measures, being accessible to both small and big farmers, would provide better prospect for agricultural marketing and their effects on agricultural development.

There are two types of trading system in the study area i.e. private trading and public trading. In private trading, the commodities are primarily operated by private traders, like wholesale traders, village traders, itinerant traders, commission agents etc. who purchase the agricultural surplus from the producers at free rate on the basis of price agreement among the trades and producer sellers. On the other hand under public (government) trading has come into existence with a view to ensure fair price for producers' surplus as an incentive to increase surplus, to minimize the seasonal fluctuation in price. Regulated markets are one of the most important agencies of agricultural marketing and it comes under the category of public or governmental trading. In the study area regulated markets are one of the important channels of agro-marketing.

Regulated markets of the study area experience various methods of transaction of agro-commodities. Among those undercover method, open auction method, private negotiation and close tender are important methods of transaction. The undercover method is practiced for foodgrains and vegetables in Chharra regulated market while it is practiced only for foodgrains in Khair regulated market of the study area. The prevalence of this method in the regulated market shows the level of corruption in these markets. Open auction method of sale is found in Dhanipur in both foodgrains and vegetables, while in Khair, Atrauli and Chharra regulated markets it is found for vegetables only. This system of sale is preferred over all other systems because of the fact that it ensures fair dealing to all parties. Private negotiation of sale is only practice in foodgarins.

There are important functionaries involved in regulated markets such as commission agents, traders, hamals (palledars), warehousemen, brokers, weighmen,

surveyers, transport agencies. Their number differs according to the status of the markets. Moreover, in this study various market channels of agro-commodities are also being identified. The commodities are passing through different channels. The channels of agro-commodities are depend upon number of factors like type of the farmers, distance from the mandi, accessibility to the village and seasonality of the produce. Size of the farmer and distance from village to the regulated market are two major factors that determine the channels of agro-commodities.

In the study area four regulated markets are established in different parts of the district. Each market provides many infrastructure facilities to the market users according to the status and degree of transaction of agricultural commodities. The details of infrastructural facilities revealed that Dhanipur market tops among the other markets in respect of amenities and facilities provided to the farmers. Khair market and Chharra market are in the second and third place while Atrauli market is in the last place in terms of provision of amenities and facilities in the market centres. On the whole it can be concluded that no market is able to provide all the listed facilities. Therefore, there is a considerable gap between the desired amenities and amenities actually provided in the market yard.

The present study analyzed the role of regulated markets on agricultural development in Aligarh district. The study area is one of the most fertile parts of Ganga plain where intensity of agriculture is very high. Agro-climatic conditions are also very favourable for cultivation of various cereal crops i.e., wheat, pulses, oilseeds, as well as some market oriented crops like vegetables and fruits. Analysis shows that food grain is one of the important commodities transected in the markets of Aligarh district, followed by vegetables like potato and onion, oilseeds comes in third position of market arrival, while pulses ranks in the last position of market arrival. Market-wise trend shows that Dhanipur has positive trend of market arrival followed by Khair, Chharra and Atrauli. Location has the direct effect on the size and trend of market arrival.

Dhanipur has highly positive trend in the market arrival of all the commodities. It is because of the biggest consuming center i.e., Aligarh city and being well connected with metalled roads with their market hinterland. It has also a well established service area consisting of 274 villages in its jurisdiction as notified area, that is why Dhanipur market is having the highest market arrival and their trend is positive. Khair is the second most important market as far as market arrivals and their trend is concerned. It is because

of big size of land holding and better accessibility around the market hinterland. Chharra and Atrauli regulated markets come in third and fourth positions in their market arrival of agro-commodities. These two markets have low market arrival and also their trend in the arrival of agro-commodities is low. Though the market arrival in these two markets has increased during study period but not very much impressive. On whole it seems that market arrival of agro-commodities has increased many folds but their effect is pronounced specific to commodity and market.

Market arrival shows the extent of regulated market consciousness among the producers. It is an index of the produce's willingness to participate in the regulated market. Market arrival trend of both primary and secondary nature shows that there are wide fluctuations in their arrival of agro-commodities in the regulated markets of the study area. Fluctuation in market arrival trend is due to changes in production pattern around market hinterland. Overall performance of the market arrival trend shows the positive growth of agro-commodities. Increase in arrival trend is due to increase in the expansion of area under crops as well as number of the farmers coming to the regulated markets in the study area. Thus, increasing trend of market arrival is considered as one of the performance variables of regulated market.

Though the regulated markets in the study area are competitive and integrated but they are not stable in arrival because of seasonal nature of crop production where as their demand is uniform throughout the year. Instability in market arrival has direct effect on price variation. Besides, long run instability on price, variation in agricultural production due to good and bad season also affects the arrival of agro-commodities. Consequently, it has direct effect on the development of agriculture and to the overall development of the area.

However, short-run fluctuations in prices result from uneven supply of the agro-commodities in the market during the year i.e. excess supply at the time of harvest, reduces the supply in the remaining part of the year. These types of the problems emerge due to lack of storage facilities, information and need for the finance on the part of the farmers in the study area. The analysis of the data also reveals that the post harvest period of all the commodities are the supplier of maximum portion of arrival due to emerging need of the farmers for cash to invest in agriculture, to meet socio-economic obligations and repayment of the credits. The flooding of agricultural products in the market, just after the harvesting season is one of major features in the district. This

supports the hypothesis that seasonal fluctuations in the arrivals of food grains in the regulated markets are pronounced in the study area.

Spatial pattern of marketed surplus in the regulated market shows that wheat accounts for highest share of 62.46 per cent of total marketed surplus of selected crops. It is followed by potato with 9.71 per cent, paddy 8.07 per cent, mustard 7.85 per cent, *arhar* 6.53 per cent, maize 3.85 per cent, onion 0.91 per cent and moong 0.54 per cent respectively. The difference in the marketed surplus of selected crops in the district is due to the difference in demand and supply of these commodities. Analysis shows that the market centers which are well connected with roads have higher proportion of marketed surplus. Dhanipur, Khair and Atrauli are the markets which come under this category. Low proportion of marketed surplus of vegetables in Chharra regulated market is because of its interior location.

Moreover, spatially the market centers which are located in the central and western part of the district have higher marketed surplus of agricultural commodities than the market centers located in the eastern part of the district. It is because of well connectivity, big size of land holdings of the farmers, good irrigation facilities and higher productivity in these regions. On the other hand lower productivity in the eastern part is due to the small size of landholdings, problem of electricity and irrigation as well as lesser spatial connectivity among the market hinterland. This supports the hypothesis that 'better spatial integration of market centers at different levels of marketing channels due to efficient transportation and other infrastructural facilities reduces spatial unevenness of marketed surplus'.

The hypothesis that 'as the distance increases, the market arrival intensity declines' does not hold true in every crops and markets. For paddy, market arrival intensity declines in Atrauli and Chharra regulated market but it is not hold true in Dhanipur and Khair regulated markets of the study area. Similarly, maize, *arhar*, groundnut, and *moong* have also registered declining trend of market arrival away from the market. Whereas mustard, potato and onion do not have identical market arrival intensity. The assumption does not hold true in case of wheat, paddy, mustard, potato and onion but for maize, *arhar* and *moong* it proves true. Thus researcher arrived at conclusion, that in a country where farming is the mainstry of the people. The variations in market arrival intensity are related in-direct proportion, other things being equal to variation in distance from market.

Regulated markets of the district have very important role in the marketing of agro-commodities because a large proportion of marketable surplus around the market hinterland are goes to these market centers. Proportion of market arrival from different zones of the market generally decreases as we moves from the market centers. But it varies market wise and crop-wise. Except Dhanipur all three regulated markets have very much ideal condition in market arrivals from hinterland. It is found that proportion of market arrivals are decreasing in the market. The hypothesis that as the distance increases the proportion of market arrival declines does not hold true in case Dhanipur, but true in Khair, Atrauli and Chharra regulated markets.

Moreover, distance does have a direct bearing on the types of farmers interacting in the regulated markets of the study area. Generally big farmers are coming to the market from far distances but in case of small farmers it is not true. The domination of big farmers/producer seller's coming from fourth and fifth zones is due to their big size of marketable surplus which is economically viable to sell in the sampled market yard as the transport and time cost is distributed in huge weight of surplus and per unit weight transport cost is reduced. Contrary to this the marginal and very small farmers have very small marketable surplus, which is not economically profitable for them to sell in distant regulated markets. Hence the first to third zone is economically favourable for them to come to the regulated mandi and sell their produce in it. They can also save their spare time and utilize them in some economic activities after selling their marketable surplus. The assumption that the farmer's having big size of land holdings even from distant zone will prefer to sell their commodities in the regulated markets without considering the transportation and other cost of marketing, is found to be satisfied in the study area.

Regulated markets are the collection point of agricultural produce therefore it regulates regional development in general and agricultural development in particular. Thus, for the assessment of agricultural development of the study area with reference to regulated markets, there is need to understand the cropping pattern, changing crop combination, ranking of value based crops, growth of area under tillage, changes in the quality of production and yields, changes in irrigated area, consumption of fertilizers and growth of technological factors.

Cropping pattern in the study area is following with sowing and harvesting season i.e., *Rabi (*58 per cent), *Kharif* (38 per cent)and *Zaid (3.48 per cent)*. Similarly, rank-wise marketed surplus of wheat, *bajra,* maize, paddy, mustard, *arhar*, barley,

sugarcane, potato, *moong*, lentil, cotton, peas, gram, onion and groundnut respectively are the leading crops in a descending order.

Cropping pattern of the study area has started to react more vigorously through the impact of markets, the increased socio-economic level of the farmers as well as their interaction to the urban sector and demand and supply of different agricultural commodities. Changes in the level of area, production and yield per hectare of principle crops at district level shows that during study period the net sown area has increased by 1.57 per cent, area sown more than once by 2.90 per cent and the cropped area by 2.05 per cent. Good percentage of increase in area sown more than once indicates that an increase in the cropping intensity of the region. With the growth of irrigation facilities and by the ever-increasing demand for agricultural commodities especially food grains, these type of growth are helpful to develop the agriculture in the study area.

All the cereals like wheat, bajra and paddy except maize and barley have recorded increased production. The increased production of wheat, bajra and paddy vary from 14.51, 31.01 and 176.34 per cent, while decreased production of barley and maize was 39.92 and 44.66 per cent respectively during study period. The largest increase in the yield has been recorded by the cash crop of potato (49.52 per cent), and it is followed by bajra (43.97 per cent), lentil (43.17 per cent), barley (23.85), wheat (20.32 per cent), paddy (16.31 per cent) and sugarcane (3.29 per cent).

With the growing emphasis on commercialization of agriculture by the establishment of agricultural markets in the district, irrigation facilities, fertilizers and other infrastructure facilities constitute important inputs in agricultural operations. Regulated markets are the leading factors towards development of irrigational facilities in the study area. Nitrogen, phosphorous and potash have increased their share in total consumption of fertilizers in the study area. Moreover, sowing machines and tractor have also increased during the study period.

In the present study market arrival is considered as an independent factor to understand the effect of market on agricultural development. The agricultural variables like production, yield, cropped area, irrigated area, fertilizer consumption, tractors, price of commodities, storage facilities, cropping intensity etc. have been taken as dependent variables. Karl Pearson's coefficient of correlation technique has been used to understand the causal relationship between the variables of regulated market and agricultural development for two different periods, viz. 1991-92 and 2002-2003.

It has been observed that inter correlation between the different variables of regulated markets and agricultural developments are strongly correlating during study period. Therefore, it may be concluded that with the passage of time inter correlation between different variables of regulated markets and agricultural development are increasing. Increasing correlation between different variables indicates that regulated markets have important role in agricultural development of the district Aligarh. Thus it supports the hypothesis that there is positive relation between regulated market and agricultural development in the study area.

Thus as a generalized statement it can be argued that regulated markets are playing a very significant role in the transaction of agricultural commodities as well as commercialization of agriculture. The flow of goods in the regulated markets takes place through different channels and their flow is determined by the number of factors like type of the farmers, distance from the market, accessibility to the village and seasonality of the produce. Trend of primary arrival shows that the production of all selected commodities is increasing because regulated markets providing necessary infrastructural facilities, market information, good price structure, all necessary inputs such as fertilizers and seeds etc., which encourage the producer farmers around market hinterland to grow their crops on commercial level over the years, thus expanding the catchmnent area of regulated market. Moreover, regulated markets of the district have close relationship with agricultural development.

. It is now commonly believed that the improved marketing facilities contribute to the agricultural development by encouraging magnitude of production. Actual loss of products is caused by the inefficiencies in their movement from the farmers to the consumers, passing through various phases like, processing, storing and transportation of the agricultural products. The variation in the storage costs and loses are very high. Transportation and handling losses also vary with the nature of crop and technique of marketing. The presence of various undesirable market charges, methods of transaction and the exploitative behaviour of the traders contribute to higher marketing costs.

Thus, the present study suggest that in order to promote the agricultural development in the study area following measures should be applied to the marketing of agro-commodities in the regulated markets of the study area.

Firstly, during the peak season after harvest, the arrivals are more, within a short period it is not possible to auction off every lot. Therefore, farmers have to wait for seven to ten days for their turn. This type of problem is prevailing in all regulated

markets of the study area. This type of situation during the post harvest period of two to three months creates congestion in the market yard. Thus there should be proper arrangements of stay in all the regulated markets for the farmers.

Until the produce is sold, the farmers have to stay at the commission agents shop to ensure that there are no losses due to pilferage, damage etc. Pilferage in small quantities is common in market which is done by the market labor class. It is observed during the field survey that in Chharra market weighing is done only 50 kg in one lot and they weigh their commodities in cloths not in a gunny bag. Therefore in every lot of weigh farmers have to give extra one to two kilograms. Moreover, *khonchi*[2] system is found in all the regulated markets of the study area. The cases of occasional theft are also not uncommon in the markets in absence of guard and proper check-posts.

Secondly, as per the State Marketing Act, all unauthorized deductions were banned. The charges for each marketing activity had also been fixed but in practice these are still found in all the regulated markets of the district. There is a practice among agents to take a sample from farmers' produce. The quantity of such samples varies from 200 grams to one kilogram and since in case such samples are taken by several traders, it turns into a net loss to the farmer. There are so many charges which have been taken from the producer and farmers such as commission, brokerage, weighment, loading, impurity charges, excessive moisture charges etc. As a result, the marketing cost of produce goes up and that too at the cost of farmer's money. Therefore there is an urgent need of market committee to check the exploitation of farmers for proper implementation of market regulation.

Thirdly, there are many methods of sale in different markets. Even in the same market, different methods are followed for different commodities. Undercover method is in practice for food grains in Chharra and Khair regulated market. Open auction method should be prevailed in all the regulated markets for all the commodities while it is practiced in Dhanipur for vegetables and food grains only. However, in Khair, Chharra and Atrauli it is practiced only for vegetables. The prevalence of under cover and negotiation methods in the regulated market shows the level of corruption because the establishment of regulated markets is to save producers from all the prevalent malpractices. Therefore there is a need to strictly apply the method of auctioning for the sale of agro-commodities by the market committee.

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2 A kind of service charges deduced from producers agro-commodities

Apart from the above mentioned problems of the farmers in the regulated markets, there are also other difficulties such as bank, post office, delay payment (in case of large marketable surplus), grading facilities, adequate market intelligence, financial problems etc. The main reason of farmer's exploitation in agricultural markets is their illiteracy and lack of organization. They are scattered over a large area with no common organization to guide and to protect their interests.

In adequate transportation, storage, costly labour, interference of mandi officials is the main problems which are faced by the traders also in regulated markets of the study area. Apart from these problems multiplicity of taxes creates harassment for them. They want to combine both sale tax and income tax for their convenience.

If the farmers secure fair prices for their produce, market information made available to him at the proper time, industries secure steady and reliable supply of raw materials of good quality, the problems mentioned above in marketing of agricultural produce can be solved. For streamlining the agricultural marketing in Aligarh, all efforts by government and allied marketing agencies should be directed to solve the prevalent problems and also a planned strategy should be prepared for future development of regulated markets and its effects on agricultural development in the district.

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DEDICATED TO MY FATHER
DR. HASHIM SIDDIQUI

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Reader

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CERTIFICATE

This is to certify that Ms. Zeba Siddiqui has completed her research work for the award of Ph.D. degree under my supervision. The thesis is entitled "Role of Regulated Markets in Agricultural Development in Aligarh". This work is an original contribution to knowledge in the field of marketing geography and in my opinion it is fit for submission and evaluation.

Dated- 22nd Jan-08

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PREFACE

With the transformation of Indian agriculture, the pattern of agricultural marketing system has also been changed in order to provide better facilities to market users. The establishment of regulated markets by the state governments is a commendable attempt in this direction. In Uttar Pradesh this Act was passed in 1964, by the 'Rajya Krishi Utpadan Mandi Adhiniyam'. Now there is a good network of regulated markets in Uttar Pradesh. These regulated markets are the controlling centres of agricultural marketing and have a crucial role not only in stimulating agricultural development but also to accelerate the pace of economic development.

In the present study an attempt is made to assess the role of regulated markets in the development of agriculture in Aligarh district.

The entire work has been divided into seven chapters. First chapter is the introductory part of the study dealing with the statement of the problem, significance of the study, objectives, hypotheses, methodology and data collection, review of selected works done by foreign and Indian geographers as well as agricultural scientists.

Second chapter examines the geographical outlook of the study area. It deals with physical profile, demographic profile, agricultural economy and non-agricultural economy of the study area. Third chapter deals with the over all view of regulated agricultural market i.e., their need, important features, objectives, significance, historical background etc. Fourth chapter describes the system of regulated markets of Aligarh district. This chapter gives a holistic view about the regulated markets of the study area.

Chapter five and six discusses the role of regulated markets through the different aspects of market arrival and through measuring market arrival intensity from market hinterland and their relation to size of the farmers coming to the markets. The last chapter examines the relationship between the regulated market and agricultural development.

At the end of the study, conclusion and suggestions have been given which may present a base for the planners to frame the plan for the improvement of regulated marketing system and agricultural development in the study area.

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Aligarh
January, 2008

Zeba Siddiqui

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CHAPTER-1

INTRODUCTION

1.1 Statement of the Problem

Regulated markets occupy an important place in the contemporary agricultural marketing scenario of India. Up to late 60's, regulated market has little importance in the country but today these markets has emerged as the most powerful instrument to revamp and radicalize the age old and traditional-bound system of agricultural marketing in India. The advent of regulated markets has undoubtedly helped in mitigating the market handicaps of producer sellers by releasing them from monopolistic power of village traders. In addition to this protective function, the regulatory apparatus has also helped in making the marketing system more efficient[1].

The traditional system of agricultural marketing in India was not healthy because it was completely a trader oriented system with prevalence of high marketing cost, unauthorized deductions of marketing charges and other malpractices. Further, relatively larger margin of middlemen in the consumer's price of various agro-products was a common feature, which reflects exploitative nature of agricultural marketing. Large seasonal fluctuations in arrivals and pricing of agricultural products was another expression of an inefficient marketing system. Since the beginning of our civilization farmers remains deprived, weak and unorganized. Therefore, they are subjected to exploitation by numerically small but economically strong and well-organized traders and middlemen. In order to check the exploitation of farmers and to make the marketing system more effective and efficient, government has established regulated markets.

Government has realized that agricultural production and marketing are two sides of the same coin. Through state action, the market system is geared to achieve social objectives, which cannot be attained by the market mechanism alone. Regulation of agricultural markets has contributed substantially in providing better returns to the farmer for his production and also in systematic

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[1] Singh, L.P (1995), Regulated Markets: Shortcomings and Correctives, in 'Indian Agricultural Marketing Emerging Trends and Prospects, P.Jagdish and P.Arvind (eds), Mittal Publications, New Delhi

development of market yards, other marketing activities and infrastructural facilities. The state's intervention in agricultural marketing in Uttar Pradesh was started with the enactment of 'Uttar Pradesh Rajya Krishi Utpadan Mandi Adhiniyam' in 1964.

Regulated market is a place where producers, sellers, traders, middlemen, market administrators and workers assemble for the marketing of agricultural products in order to fulfill the demands of our society[1]. The main works of markets are to provide better prices to the farmers and availability of agricultural commodities to the consumers and food processing industries at reasonable rates. Besides these facilities, creation of basic infrastructure for development of modern marketing system is imperative for strengthening the competitiveness of Indian agriculture in the global market.

Regulated market has immense potential to help not only to the rural people but also to the entire spectrum of market users in both rural and urban centres. It is a cardinal point in the nation's distribution of surplus agricultural produce. The process of economic development in rural areas, through regulated market is like that the surplus agricultural produce arrives at this wholesale terminal market, directly through the village producers or through primary and secondary markets in hierarchical pattern. It provides the facility of grading, standardization and quality control measures, ancillary facilities, construction of rural link roads, and diffusion of agricultural innovations etc., which give impetus for increasing the agricultural productivity. Consequently, more surplus income is generated, which may be reinvested in agricultural inputs and may place more demands for exotic goods and services in rural areas.

Through the market regulation many positive and negative impacts on society may be reflected. Economic viability of the farming system, employment generation, foreign exchange to the nation through the agro-export and living standard of Indians also improved up. Besides these positive

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[1] Saxena, H.M., (1992), Regulated Agricultural Markets: A Case Study of Rajasthan, Rawat Publications, Jaipur, p. 158.

impacts, there are many malpractices prevailing in the regulated markets such as low prices in the market, lack of government procurement, and marketing information, lack of credit for marketing of produce, monopoly of traders in the market, forced sale in the market at below minimum support price, unnecessary deductions and charges, high rates of commission and market fee etc.

Therefore, regulated markets are important means to increase the income of farmers and level of consumer's satisfaction. The farmers allocate their resources according to their comparative advantage and invest modern inputs to obtain higher productivity and production. This in turn contributes to increased marketed surplus of farm products and resulting agricultural development.

The topic selected for the research work is important for both academic and planning purpose. Academically, it would help in creating new insight to understand what role is being played by regulated market in the development of agriculture. On the other hand at policy level it would generate the accurate data to understand the existing problems in the regulated markets.

1.2 Significance of the Study

The present research work can play a vital role in formulating the policies for the development of agriculture through the regulated markets. The district Aligarh has been selected as the study area. Agriculturally Aligarh district is one of the developed districts of western Uttar Pradesh as this district is the witness of Green Revolution[1]. Majority of the people in the district are engaged in agricultural activities. Therefore rural population of the study area is depends on efficient marketing system for the sale and purchase of agro-commodities. The regulated markets provide all the necessary facilities for the efficient movement of agro-commodities from the producers to the consumers. The transaction through the regulated markets are contributing significantly in enhancing the income of farmers which leads agricultural development in the study area.

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[1] Government of India has initiated a policy to increase food production in some district in the country by using modern technology during late 1960 s.

Thus regulated markets and its role in agricultural development is important aspect of marketing geography. An understanding of these factors of the study area will provide empirical evidences for the planners and the policy makers to formulate policies which shall be helpful in agricultural development.

1.3 Objectives of the Study

Taking into consideration the aforesaid conditions and features of Indian agriculture with reference to marketing, following objectives have been formulated:

1. To find out the nature and mechanism of agro-marketing and facilities and amenities in the regulated markets of the study area.
2. To estimate the trend and pattern of temporal variation in primary and secondary arrival as well as seasonal primary arrival of agro-commodities.
3. To assess the proportion of market arrival intensity of different agricultural commodities from the market hinterland.
4. To assess the number and proportion of producer sellers of various size of land holdings coming to the regulated markets.
5. To understand the variables which are plying important role in agricultural development through marketing of surplus agro-commodities.
6. To suggest remedial measures for better regulated market, which will help in agricultural development of the study area.

1.4 Hypotheses

For achieving the success in understanding the discussed objectives, some hypotheses would also be tested. These hypotheses are given below:

1. Positive market arrival is one of the performance variables of the regulated market.
2. Seasonal fluctuations in the arrivals of agro-commodities in the regulated markets are pronounced.
3. Efficient transportation and other infrastructural facilities reduce spatial unevenness of marketed surplus.
4. Highest market arrival intensity zone and proportion of marketed surplus of agro-commodities are closest to the market centres. It is inversely related with the distance from the market.

5. The number of sellers and frequency of their visit to market decreases as the distance increases from the market centres.
6. There is positive relation between regulated market and agricultural development.

1.5 Methodology and Data Collection

The study is based on both primary and secondary source of data. Primary data have been generated from two tier of geographical locations i.e., regulated markets and its hinterland villages. The hinterland region of each regulated market is divided into different concentric zones based on distance of 2 kilometres apart. Three villages from each concentric zone have been selected for detailed enquiry. Fifteen villages have been selected around each regulated market notified area on the basis of stratified random sampling technique. Thus total sixty villages have been selected keeping in view some special considerations viz, road connectivity and the interior location around regulated markets of the Aligarh district.

Further 10 per cent of producer sellers and traders from each regulated markets and fifty households from every sampled village have been selected on the basis of stratified random sampling. Data was collected in 2004-2005 on the basis of detailed questionnaire. Villagers have been thoroughly interviewed regarding various aspects of regulated markets and its impact on agriculture development. All the sampled villages were visited before conducting survey. In this preliminary survey, list of households was prepared and village inhabitants were classified on the basis of size of land holdings, i.e. marginal, small, medium, big and very big farmers. Keeping in view total 50 households from each village, belonging to different categories according to size of land holding were selected in the proportion.

The data regarding the arrival of agro-commodities have been collected from the agricultural market committee of each regulated market, which keeps the regular records of daily, weekly, monthly and annual arrival of agricultural products.

Only nine major crops namely paddy, wheat, maize, arhar, moong, mustard, groundnut, potato and onion have been taken into consideration. The

crops were selected on the basis of production and the quantity reached in the market. In addition to primary data, secondary data have been collected from Census Office Lucknow, District Statistical Office Aligarh, The Directorate of Marketing and Inspection Faridabad, District Industry Office Aligarh.

The collected data was analyzed by using different statistical techniques like simple percentage, Weaver's Crop Combination region, Karl Pearson's Coefficient of Correlation to derive conclusions regarding the role of regulated markets in the development of agriculture.

1.6 Study Area

The study area is located in upper Ganga Yamuna *doab*. It is one of the most agriculturally developed district of Western Uttar Pradesh. It lies between 27° 34′ N to 28° 11′ N latitudes and 77° 29′ E to 78° 38′ E longitudes, covering an area of 3691.54 sq. kms and inhabitating 2992286 persons (2001).

Aligarh district is selected as study area because it is agriculturally development district of Western Uttar Pradesh and the district has been selected for green revolution during their initial phase. The district is well served by regulated markets and becomes one of the important marketing channels for agro-marketing. Agriculture is practiced intensively securing 168.93 per cent cropping intensity index. Intensive and extensive farming are done on 481619 hectares of land.

Aligarh is divided into 5 sub-divisions and 12 developmental blocks. The district has 1181 villages and 13 towns. The district has 4 regulated markets and 6 sub-markets.

1.7 Literature Review

Marketing geography is important sub-field of economic geography. Geographers up to 1950 rarely undertook the study of distributive system of commodities and services between producer and consumers. Some sporadic discussions and surveys had been made on marketing activities, both in rural and urban centres. But these contributions belong to either urban, industrial or agricultural geography.

However, marketing geography has it roots in 5th decade of the 20th century. During the last 5 decades there has been a significant and growing interest towards the study of market places and exchange system. But most of these studies have been made by economists, anthropologists and commercialists in their own approaches (Saxena, 1992)[1].

Moreover, during the 20th century especially after 1930, the attention of geographers was towards the study of market centres. The market centres were considered as functions of centrality, which provide various types of functions and services to their hinterlands.

With the introduction of Christaller's Central Place Theory (1933)[2] and Losch (1954)[3] the study of service centres including wholesaling and retailing became common.

William Applebaum (1954)[4] was the founder of this discipline and he defined the field and scope of marketing geography. He was of the opinion that marketing geography is concerned with the delimitation and measurement of market with the channel of distribution through which goods move from producers to consumers.

B.W.Hodder (1965)[5] highlighted the distance factor in determining the demand of goods in the market centres. Skinner (1965)[6] recognized the rural markets as the smallest unit associated with intermediate and central markets at national level of exchange system. Thorpe and Nader (1967)[7] were of the

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1 Saxena,H.M. (1992), Regulated Agricultural Markets-A Case Study of Rajasthan, Rawat Publications, Jaipur, Delhi

2 Christaller, W (1933), Die Zentralen Orte in Suddeutscheanel, There, English Translation by Baskin, C.W. (1966), Central Place in Southern Germany, Prentice Hall, Engl. Wood Cliff.

3 Losch, A (1954), Dierauliche Ording Deriwins Witschalf, Jena Fischer, Trans. By Woglom, W.H and Stopler, W.F., The Economics of Location, New Haven, Yale Uni.

4 Applebaum, W (1954), Marketing Geography in James, P.E. and Jones, C.F (ed), American geography: Inventory and Prospect, Syracus.

5 Hodder, B.W (1965), Distribution of Markets in Yarubaland, Scottish Geographical Magazine, Vol.81, pp.48-58.

6 Skinner, G.W (1965), Marketing and Social Structure in Rural China, Journal of Asian Studies, Vol.24, pp.3-45.

7 Thorpe, D and Nader, G.A (1967), Customer Movement and Shopping Centre Structure: A Study of Central Place System in Northern German, Regional Studies, Vol.1, pp.173-191.

opinion that a subjective four rank hierarchy in the North Durban, based on the index of centrality was justified by hierarchical structure of consumer's behaviour in the system.

Brush and Gauthier (1968)[1] studied the origin and development of various centres. Their actual shopping facilities in quantity and quality, their functional arrangement in relation to residential area, communication and finally movement of consumers with reference to private motor car, to food purchase and other type of shopping expedition and their combination were taken under consideration. Vance (1970) [2] worked on the study of wholesaling geography. He examined the factors underlying the distribution and organization of wholesale activities. Smith (1972)[3], Eighmy (1972)[4], Symnaski (1974)[5] analyzed the periodic market locations and frequencies in different study regions of the world.

Barbara Harris contribution, in the field of agricultural marketing is most notable. She has written many articles such as Food grain Markets-A Critique (1960), Role of Punjab Markets as Regulated Growth Centres (1974)[6] etc.

A few edited volumes contain very good works on agricultural marketing especially in developing countries. Proceedings of INCOMES, Vol.1, entitled 'Marketing Systems for Developing Countries[7]' has provided background for study of agricultural markets. Literature on marketing

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1 Brush, J.E and Gauthier, H.L (1968), Service Centre and Consumer Price, University of Chicago Research Paper, 113.

2 Vance, J.E. Jr (1970), The Merchants World, The Geography of Wholesaling, New Jersey.

3 Smith, R.H.T (1972), "The Synchronization of Periodic Market" in W.P.Adams and F.M.Halleiner (eds), International Geography, Vol.1, pp.591-593, Toronto.

4 Eigmy, T.H. (1972), Rural Periodic Markets and the Extension of an Urban System, A West Nigerian Example, Economic Geography, Vol.48, pp.299-315.

5 Symnaski, R (1974), Complex Periodic Market Cycle, Annals of Association of American Geographers, Vol.64, pp.203-213.

6 Harris Barbara (1974), The Role of Punjab Wheat Markets as Growth Centers, Geographical Journal, Vol.140, pp.52-71.

7 Izraili, D., Izraili, D.N., Meissner, F (eds.) (1976), Agricultural Marketing in Developing Countries, INCOMES Proceedings, Vol.1 and 11, John Wiley, New York.

geography in the form of review and bibliographies during 1970 was developed by R.J.Bromely (1971, 1974, 1979)[1].

With the establishment of the International Geographical Union (IGU), a working group on market distribution system / market place-exchange system (1972-73), the study of marketing activities in geography has been accelerated, not only in developed countries, but also in developing countries like India. The pace of development has been very rapid during the eighties of the twentieth century. The existing study group was transformed into study group of Commercial Activities in France IGU Summit in 1988. Afterwards this group was developed as IGU commission on commercial activities in 1993 and in Hague summit (1996) it was restructured and named as study group on Globalization of Retailing. At present this study group is continued as IGU Commission of Globalization of Retailing. Thus, the field and scope of marketing geography has widened to a considerable extent.

1.7.1 Studies on Regulated Markets

The studies on the market efficiency in general and on the working of regulated markets in particular taking into consideration the role and importance of agricultural marketing in the under developed countries like India have not been undertaken seriously in the past.

After 1930 such study came into existence, which attracted the attention of geographers towards the study of market centres. A very sporadic attempt was made by geographers of developing countries especially in India during 1930-50 to study the market centres.

Regarding the working of regulated markets, a few official studies were made by the expert committees appointed by different state governments. Among them the report of Dantwalla Committee (1950)[2] need to be especially mentioned. This committee was appointed by the government of Bombay to

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1 Bromely, R.J (1979), Periodic Markets in Fairs: A Bibliography (Supplements to 1974), Monish Publication in Geography.

2 Government of Bombay, Report of the Enquiry into Regulated Markets in Bombay State, Interim Report, (1950-51).

review the working of regulated markets in the state and to suggest necessary changes in the legislation.

The Directorate of Marketing and Inspection brought out a brochure in (1956)[1] to compile the marketing legislations prevailing in the concerned states and to present a comparative picture of these legislations, so that it could serve as a guide to the states that had not enacted the market legislations.

During sixties and seventies studies on regulated markets made remarkable progress in India. Notable contributions were made during this period. Mirchandani and Hiranandani (1963)[2] made an effort to review the progress of regulated markets in India. They were of the opinion that the regulated markets helped to develop marketing sense among the producers, who often meekly submitted to the wishes of traders.

The study conducted by Joshi (1966)[3] on 'Regulated Markets in Gujarat' reveals that the Markets Act in Gujarat state did not remove the obstacles in the formation of regulated markets. The studies on marketing efficiency were made by Jasdanwala (1966)[4] Cummings (1967)[5] and Holmes (1969)[6]. These studies have concluded that Indian agricultural markets are fairly competitive and the existing market structure does not need any radical changes at the present stage of Indian economy.

The examination of the magnitude and direction of changes in the structure, organization and operation of grain markets in Punjab was studied by

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1 Government of India (1956), Directorate of Marketing and Inspection, Working of Regulated Markets in India, Regulated Markets, Vol.I, Legislations, Nagpur.

2 Mirchandani, R.T and Hiranandani, G.J (1963), Regulated Markets: Their Review and Impact on Market Structure and Efficiency, Seminar on Marketing of Agricultural Commodities, Indian Society of Agricultural Economics, Bombay.

3 Joshi, V.R (1966), Regulated Markets in Gujarat, Ph.D. Thesis, Sardar Patel University, Vallabh Vidya Nagar.

4 Zaibun, Y.Jasdanwala (1966), Marketing Efficiency in Indian Agriculture, Allied Publishers Bombay.

5 Cummings, R.W.Jr (1967), Pricing Efficiency in Indian Wheat Market, Impex India, Delhi.

6 Holmes, S (1969), Market Structure and Conduct of Food grain Pricing Efficiency in a North Indian Tehsil, Ph.D Thesis, University of Marry Land.

A.S. Kahlan (1970)[1]. It was observed that market technology and other improvements in the marketing structure have not kept pace with the efforts to provide the market yards at suitable sites to permit efficient handling of agricultural products.

The study conducted by Radhakrishnan (1971)[2] on the marketing of groundnut and cotton crops in Khandesh region by selecting nine regulated markets. He observed that one or two big buyers exercised command over the bulk of total quantity transacted in the regulated markets.

S.C.Mallick (1976)[3] made a study on 'Rice Marketing in Orissa and found that regulated markets in the state suffered from inadequacy of transport facilities and failed in controlling the prices of the commodities in the market.

B.D. Kulkarni (1977)[4] studied various aspects connected with the management of regulated market in Sholapur district. The author examined several malpractices at length and finally concluded that most of the markets were not able to discharge the basic responsibilities on their part and hence succeeded only partially in their endeavour.

The study conducted by Subba Rao (1978)[5] on 'The Examination of Economic Efficiency of Paddy Marketing System at Village Level in West Godavari District of Andhra Pradesh' revealed that there were many imperfections in marketing of paddy at village level. It was found that primary and secondary market price integration was weak particularly in less developed villages. Barbara Harris (1980)[6] examined the effects of market regulation in reducing the degree of imperfections with which different market functions

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1 Kahlan, A.S (1970), Impact of Changing Conditions on Grain Marketing Institutions and the Structure of Grain Markets in Punjab, Punjab Agricultural University, Ludhiana.

2 Radhakrishnan, V (1971), Marketing of Cash Crops: With Special Reference to Ground nut and Cotton in Khandesh, Ph.D Thesis, Uni. of Bombay.

3 Mallick, S.C (1976), Marketing of Rice in Orissa, Ph.D Thesis, Orissa University of Agriculture and Technology.

4 Kulkarni, B. D (1977), Functioning of Regulated Markets in Sholapur District with Special Reference to Groundnut and Bajra, Ph.D Thesis, Shivaji University.

5 Subba, R.K (1978), Rice Marketing System and Compulsory Levies in Andhra Pradesh, Allied Publishers Private Limited, Bombay.

6 Harris, B (1980), Regulated Foodgrain Markets, A Critique Social Scientist, viii, March.8, pp.22-31.

through time and space. The study concluded that regulated marketing has apparently been felt to halt the rise in the level of market imperfections.

A. Siva Rama Prasad (1981)[1] studied on working of regulated markets in Andhra Pradesh by selecting six markets as samples. The study made an attempt to measure the operational efficiency in quantitative terms. L.P.Singh (1983)[2] made a study to examine how far regulated markets have been able to accomplish their objectives in India. A. Siva Rama Prasad (1985)[3] undertook a study on the role and working of selected regulated markets in Andhra Pradesh. This work was based on the author's dissertation submitted for PhD in Andhra University in 1982. Apart from the origin and growth of markets, it provides depth analysis on the market facilities and amenities, the market practices, the volume of business transactions, financial performance, operational efficiency etc.

The study by S.S. Acharya and N.L. Agarwal (1987)[4] on agricultural marketing in India evaluates the performance of the existing marketing system, institutions and policy in accelerating agricultural development of the country. It is an incisive analysis with special emphasis on marketing functions, institutions, efficiency, cost and margins, government efforts in the improvement of agricultural marketing and market research.

Gulab Nath Singh, *et.al* (1987)[5] analyzed the growth and development of regulated markets, its main characteristics, advantages, organization, constitution of market committees, finances and functions etc.

G.Narasimha Murthy's (1988)[6] study evaluates the performance of selected regulated markets in the backward region of Warangal district of

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1 Siva Rama Prasad, A (1981), Management of Regulated Markets "A Study of Organizational Performance of Selected Regulated Markets in Andhra Pradesh, Ph.D Thesis, Andhra University, Watlain.

2 Singh, L.P (1983), Regulated Markets in India, Capital Publishers, Delhi.

3 Siva Rama Prasad, A (1985), Agricultural Marketing in India, Mittal Publications, Delhi.

4 Acharya, S.S and Agarwal, N.L. (1987), Agricultural Marketing in India, Oxford and IBH Publishing Company, Delhi, India.

5 Singh, G.N., Singh, D.S and Singh, R.I (1987), Agricultural Marketing in India, Chugh Publications, Allahabad, India.

6 Murthy, G.N (1988), Regulated Markets in a Rural Economy, Ajanta Publications, Delhi.

Andhra Pradesh. A comprehensive approach is followed in evaluating the performance in terms of varied dimensions like physical and financial performance, price efficiency, competitive conditions etc.

H.M.Saxena (1992)[1] has proposed the analysis of regulated market in terms of growth, organization, structural pattern, commodities, trade areas, market efficiency, role of market etc.

Anita Arya (1993)[2] pointed out the working strategy of regulated markets in Gujarat and analyzed the characteristics of a competitive market, and its integration, market stability, cost of buying and selling, market arrival etc.

Abha Lakshmi and Shahab Fazal (1994)[3] discussed general conditions of the sampled farmers and revealed that marketing facilities in the study region are deplorably poor and despite the presence of government officials, malpractices are rampant.

P.R. Chauhan and R.S. Singh (1999)[4] studied regulated agricultural markets and rural development of eastern Uttar Pradesh and concluded that these market centers operate not only like an exchange centres but also provide market infrastructures at site and diffuse the agricultural innovations and its spatio-functional integration with the marketing network of the area.

O.P. Sharma (1999)[5] made an effort to study the regulated market as a focal point of economic development of Mohibullapur market of Lucknow, and found that fair price regulation, quality control, market infrastructure, construction of rural link roads etc. are some of the factors which help in rising

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1 Saxena, H.M (1992), Regulated Agricultural Markets-A Case Study of Rajasthan, Rawat Publications, Jaipur, Delhi.

2 Arya, A (1993), Agricultural Marketing in Gujarat, Concept Publishing Company, New Delhi.

3 Singh, A.L and Fazal, S (1994), Marketing of Agricultural Produce by the Farmers in Upper Ganga-Yamuna Doab, India, The Geographer, Vol.XLI, No.1, pp. 1-12.

4 Chauhan, P.R and Singh R.S (1999), Regulated Agricultural Markets and Rural Development: A Case Study of Eastern Uttar Pradesh in V.K. Shrivastava (eds) Commercial Activities and Development in the Ganga Basin, Concept Publishing Company, New Delhi, pp 257-268.

5 Sharma, O.P (1999), Regulated Market as a Focal Point of Economic Development: A Case Study of Mohibullapur Mandi, Lucknow in V.K. Shrivastava (eds) Commercial Activities and Development in the Ganga Basin, Concept Publishing Company, New Delhi, pp 269-283.

agricultural production and rural income, leading to the socio-economic transformation of the surrounding area.

C.T.Pawar and T.N.Lokhande (2000)[1] have assessed to analyze the spatial distribution, centre, relationship to physiography and area of market etc. which provided the conclusion that the significant relationship of market centres with population and net sown area exists. It is also concluded that this region has random and regular distributional pattern of market centers.

R.S.Dixit (2001)[2] has studied the distribution of the regulated agricultural markets of Uttar Pradesh and analyzed the theoretical patterns of regulated agricultural markets in terms of area, population and inhabited villages.

H.M.Saxena (2003)[3] analyzed the nature and characteristics of market place participants and their behavioural pattern in urban markets as well as agricultural markets.

S.K.Sharma and Devendra Singh (2003)[4] have assessed that market genesis theory is not fully responsible for the existing structure and functions of market places in the state.

Z.Siddiqui, N. Khan and M.Hoda (2003)[5] studied role of regulated market in the development of vegetable cultivation and concluded that Dhanipur regulated market played an important role in the development of vegetable cultivation.

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1 Pawar, C.T and Lokhande, T.N. (2000), Spatial Distribution of Market Centers in Kolapur District Maharashtra, Geographical Review of India, Vol. 62, No.1, pp.71-80.

2 Dixit, R.S (2001), Analysis of Spatial Distribution of Regulated Agricultural Markets, Geographical Review of India, Vol.63, No.2, pp. 141-152.

3 Saxena, H.M (2003), Marketing Behavior A Regional Analysis, R.B.S.A. Publishers, Jaipur.

4 Sharma, S.K and Singh. D (2003), Spatio-Temporal Trend of Marketing of Agricultural Produces in Madhya Pradesh, The Geographer, Vol.50, No.1, pp.74-85.

5 Siddiqui, Z, Khan, N and Hoda, M.M (2003), Role of Regulated Market in the Development of Vegetable Cultivation in North India: A Case Study, The Geographer, Vol.50, No.1, pp.86-107.

M.M.Hoda (2006)[1] analyzed a systematic study of the nature of marketed surplus, marketing costs and price structure of six important crops at three tier marketing agencies.

1.7.2 Studies on Agricultural Development

A review of geographical literature reveals that in India very few attempts have been made to define agricultural development and to select criteria of development in the light of any conceptual framework. Among all the studies the dominating focus is only on productivity dimensions. Agricultural development is unquestionably a multi-dimensional concept of which crop production, crop diversification and commercialization of agriculture are chief components.

Kumaraswamy (1969)[2] presented a study which provides detailed and exhaustive comments on the strength of co-operations in agriculture. Cooperative has been contributing in several ways to the development of agriculture especially in the matter of distribution of loans and supplies of agricultural inputs. It ensures the balanced growth of production in which all section of farming community can take their full share. Cooperative helps in providing both short and long-term loan to the farmers. Cooperatives have also supplied new varieties of seeds, fertilizers and implements to the farmers. Cooperative also helps farmers in providing marketing and other services.

Kanwar (1970)[3] has focused attention on the modernization of Indian agriculture. According to him the new technology of production is based on the use of fertilizer, HYV seeds, pesticides, scientific water management and other agronomic practices. In this way the suitable implements and machinery have become necessity for the development and modernization of Indian agriculture.

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1 Hoda, M.M (2006) Agricultural Marketing in Backward Regions (2006), Rajat Publication, New Delhi.

2 Kumarswamy, S (1969), Expending Role of Cooperative in Agriculture, Agricultural Situation in India, Vol. XXIV, No.3.

3 Kanwar, J.S (1970), The Role of Machinery in Modernization of Agriculture, Indian Farming, Vol.XIX, No.11.

Rao (1971)[1] described that the major cause of inter-state variations in crops output is the difference in the growth of irrigated area among the states.

Alam (1974)[2], using data for individual *tehsils* in his study of regional disparities in development in Andhra Pradesh, employed six indicators from the agricultural sector. Two of these related to productivity (agricultural output per agricultural worker and per acre) and four to agricultural development (percentage of gross irrigated area, gross cropped, canal irrigated and double cropped area).

Raza (1978)[3] after analyzing 41 indicators, grouped four subsets of productivity, production conditions, agrarian relations, change in agriculture and measured productivity in term of output per hectare, per worker, per tractor, per tube-well and per unit of fertilizer.

Noor Mohammad (1981)[4] has pointed out that technological change in agriculture consists of adoption of farming techniques developed through research and calculated to bring out diversification and increase in agricultural production and greater return to farmers. The use of fertilizers, improved varieties of seeds, pesticides, improved irrigation facilities and new agricultural implements are capable of increasing agricultural productivity.

Krishna (1992)[5] emphasized that agricultural development, in true sense denote the quality of agricultural system of a region in terms of productivity, diversification and commercialization consistent with desired state of agrarian relation and ecological balance.

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1 Rao, S.K (1971), Inter Regional Variations in Agricultural Growth, Economics and Political Weekly, Vol. VI, No.27.

2 Alam, M (ed), (1974), Planning Atlas of Andhra Pradesh, Pilot Map Production Plant, Survey of India, Hyderabad, p.3.

3 Raza, M (1978), Levels of Regional Development in India, Indo-Soviet Symposium on Regional Development and National Planning, Tiblisi.

4 Mohammad, N (1981), Technological Change and Diffusion of Agricultural Innovation, Perspective in Agricultural Geography, Vol.IV, p.267, New Delhi.

5 Krishna, G (1992), The Concept of Agricultural Development in Noor, M (ed.), Dynamics of Agricultural Development, Vol.7, pp.29-36.

Thakur (1992)[1] viewed that after independence, particularly during the last two decades, there has been considerable change in almost all the parameters of agriculture in India; due to the variation in physical, socio-economic conditions, change in agriculture are not uniform all over the country either spatially or temporally.

Shafi (1981)[2] emphasized that the optimum use of land for production depends on to a large extent on the level of technology and the system of farming. In his opinion there are two ways for increasing food production:

(a) Increasing the area under cultivation.

(b) Increasing the output per head.

He also points out that one of the major hindrances in the optimal use of land lies in the land tenure system.

Davey (1975)[3] pointed out that the development of agriculture is to be judged from the degree of equity in farm incomes and the nature of agrarian relations. The test of any development is the extent to which it delivers social justice. The unequal distribution of land ownership and economic power makes it possible and profitable for the landowner to combine various modes of exploitation of the rural poor.

Frankel (1971)[4] has pointed out that one of the conspicuous weaknesses of Green Revolution was that it widened the disparities in farm income. An attempt of agriculture development however should not produce deterioration in ecological conditions. It should not lead to disfigure of forests, exhaustion of soil nutrients, depletion of underground water and emergence of water logging conditions. Conservation of physical resources is an integral part of any agricultural development.

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1 Thakur, A (1992), Patterns of Agricultural Growth in Noor, M (ed.), Dynamics of Agricultural Development, Vol.7.

2 Shafi, M (1981), Increasing our Agricultural Production, The Geographer, Vol.28, No.1, pp.1-8.

3 Davey, B (1975), The Economic Development of India, Spokesman Books, p.175.

4 Frankel, F.R (1971), India's Green Revolution, Princeton, University Press, Bombay, p.191.

According to M.R.Khurrana (1992)[1] the differences in the levels of agricultural development in a particular district is largely in terms of differences in irrigation facilities, rural electrification, use of chemical fertilizers, adoption of HYV of seeds and so on.

Nalini Govind (1986)[2] studied the spatial and temporal dimensions at different area levels (National, states and districts and within them the sample land holdings). Such an approach provides a realistic regional framework for evaluating the potential of different crops in the country and to formulate the spatial strategies in conformity with the regional realities.

Ram Rajpati (1989)[3] has studied that the main thrust of agricultural development lies on increasing per hectare crop yields and the total production which can be achieved mainly through practicing multiple cropping, adopting high yielding crops and rational use of economic resources.

Shafiqullah (1999)[4], has studied that after a long gap of eight years, a very little change was noticed in terms of spatial pattern of agricultural development.

S, Rahman and J.K.Routray (2000)[5] analyzed the regional imbalance in agricultural development over two decades by selecting some important indicators. Study reveals the fact that persistent stagnancy of regions over time and the dominance of crop productivity and technology factors in explaining inter-regional variations.

It is noticeably admitted fact that markets are incorporated of multifunctional activities like commercial, political and social etc. They

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1 Khurrana, M.R (1992) Agricultural Development and Employment Patterns in India, p.47.

2 Govind, N (1986), Regional Perspectives in Agricultural Development, Concept Publishing Company, New Delhi.

3 Rajpati, R (1989), Agricultural Development and Planning in India, Criterion Publications, New Delhi.

4 Shafiqullah (1999), Levels of Agricultural development in Gonda District, U.P., Geographical Review of India, Vol.61, No.4, pp.361-371

5 Rahman, S and Routray, J.K (2000),Regional Variation in Agricultural Development in Bangladesh and Policy Implications, Indian Journal of Regional Science, Vol.XXXII, No.1, pp.1-13

contribute in economic development and social integration of the rural society. Hierarchy, trade area and planning perspectives have attracted quite a good number of marketing geographers. The researchers have over looked planning perspective and related aspects.

After the review of literature related to agricultural marketing, it is clear that the geographers and economists have done a lot of works in the field of regulated markets. But most of these studies are mainly concerned with regulated market morphology, price structure, market integration, marketable surplus, market margins, commodity structure, market administration, market participants behaviour etc. However, the role played by regulated markets in agricultural development has been ignored which can play a significant role in a developing country like India in general and Aligarh district in particular.

1.8 Chapter Design

The present research work unfolds various aspects of regulated markets of Aligarh district both in term of time and space. The study has been divided into seven chapters.

First chapter deals with the statement of the problem, significance of the study, objectives, hypotheses, methodology of research and data collection, study area and review of literature.

Second chapter examines the geographical outlook of the study area. It deals with physical conditions, demographic characteristics, agricultural and non-agricultural economy of the study area. The study area embodies a distinct geographical personality in terms of physical and socio-economic conditions. These geographical factors are responsible for reshaping and designing the geographical landscape.

Third chapter deals with the over all view of regulated agricultural marketing i.e., their need, important features, objectives, significance, historical background. Besides, it also deals with administrative organization, composition and organization of market committee, infrastructural facilities, notified commodities and site of the regulated markets.

Fourth chapter describes the system of regulated markets in the study area. This chapter analyzes location and distribution of regulated markets, proportion of marketed surplus of different crops marketed through different agencies of agricultural marketing system, method of transaction of agricultural products, market functionaries, marketing channels of the agricultural products, infrastructural facilities and trading premises.

Fifth chapter discussed the role of regulated markets of the study area. This chapter is mainly devoted to the study of trends and patterns of market arrival in spatio-temporal dimensions of the regulated markets of Aligarh district. The volume of business transacted and its character is the important indicator for assessing the role of regulated market. In this chapter an attempt has been made to examine the behaviour of arrivals in the regulated markets of the study area.

Sixth chapter examines the market arrival intensity and proportion of marketed surplus in regulated markets from different zones of market hinterland. And try to estimate the number of producer sellers coming from different zones according to the size of land holdings in different regulated markets.

Seventh chapter assesses the role of regulated market in agricultural development with reference to area, production and yield of different crops for a period of 12 years from 1991-92 to 2002-2003. In this chapter an effort has been made to understand the factors which are crucial in agricultural development. Moreover, relation between the market and agricultural development variables have been examined to understand the role being played by the regulated markets in agricultural development of the district using Karl Pearson's Coefficient of Correlation.

In the last conclusion and summarizes main findings of the study and highlights its importance for further research. However, some important suggestions for improvement of agricultural marketing system in regulated markets of Aligarh district have also been made.

References

Acharya, S.S and Agarwal, N.L. (1978), Agricultural Marketing in India, Oxford and IBH Publishing Company, Delhi, India.

Alam, M (ed), (1974), Planning Atlas of Andhra Pradesh, Pilot Map Production Plant, Survey of India, Hyderabad, p.3.

Applebaum, W (1954), Marketing Geography in James, P.E. and Jones, C.F (ed), *American geography: Inventory and Prospect*, Syracus, pp. 245-51.

Arya, A (1993), Agricultural Marketing in Gujarat, Concept Publishing Company, New Delhi.

Bromely, R.J (1979), Periodic Markets in Fairs: A Bibliography (Supplements to 1974), Monish Publication in Geography.

Brush, J.E and Gauthier, H.L (1968), Service Centre and Consumer Price, University of Chicago Research Paper, 113.

Davey, B (1975), The Economic Development of India, Spokesman Books, p.175.

Chauhan, P.R and Singh, R.S (1999), Regulated Agricultural Markets and Rural Development: A Case Study of Eastern Uttar Pradesh, in 'Commercial Activities and Development in the Ganga Basin, Shrivastava, V.K. (eds), Vol.46, No.2, pp.257-268

Christaller, W (1933), Die Zentralen Orte in Suddeutscheanel, There, English Translation by Baskin, C.W. (1966), Central Place in Southern Germany, Prentice Hall, Engl. Wood Cliff.

Cummings, R.W.Jr (1967), Pricing Efficiency in Indian Wheat Market, Impex India, Delhi.

Dixit, R.S (2001), Analysis of Spatial Distribution of Regulated Agricultural Markets, Geographical Review of India, Vol.63, No.2, pp. 141-152.

Eigmy, T.H. (1972) Rural Periodic Markets and the Extension of an Urban System, A West Nigerian Example, Economic Geography, Vol.48, pp.299-315.

Eswarappa (1991), Market Complex in Bangalore City: A Story of Success and Failure, The Indian Geographical Journal, Vol.66, No.1, PP.59-62.

Frankel, F.R (1971), India's Green Revolution, Princeton, University Press, Bombay, p.191.

Government of Bombay, Report of the Enquiry into Regulated Markets in Bombay State, Interim Report, (1950-51).

Government of India (1956), Directorate of Marketing and Inspection, Working of Regulated Markets in India, Regulated Markets, Vol.1, Legislations, Nagpur.

Govind, N (1986), Regional Perspectives in Agricultural Development, Concept Publishing Company, New Delhi.

Harris, B (1980), Regulated Foodgrain Markets, A Critique Social Scientist, VIII, March.8, pp.22-31.

Harris, B (1974), The Role of Punjab Wheat Markets as Growth Centers. Geographical Journal, Vol.140, pp.52-71.

Hoda, M.M (2006) Agricultural Marketing in Backward Regions, Rajat Publication, New Delhi.

Hodder, B.W (1965), Distribution of Markets in Yarubaland, Scottish Geographical Magazine, Vol.81, pp.48-58.

Holmes, S (1969), Market Structure and Conduct of Food grain Pricing Efficiency in a North Indian Tehsil, Ph.D Thesis, University of Marry Land.

Izraili, D., Izraili, D.n., Meissner, F (eds.) (1976), Agricultural Marketing in Developing Countries, INCOMES Proceedings, Vol.1 and 11, John Wiley, New York.

Joshi, V.R (1966), Regulated Markets in Gujarat, Ph.D. Thesis, Sardar Patel University, Vallabh Vidya Nagar.

Kahlan, A.S (1970), Impact of Changing Conditions on Grain Marketing Institutions and the Structure of Grain Markets in Punjab, Punjab Agricultural University, Ludhiana.

Khurrana, M.R (1992) Agricultural Development and Employment Patterns in India, p.47.

Kulkarni, B. D (1977), Functioning of Regulated Markets in Sholapur District with Special Reference to Groundnut and Bajra, Ph.D Thesis, Shivaji University.

Kumarswamy, S (1969), Expending Role of Cooperative in Agriculture, Agricultural Situation in India, Vol. XXIV, No.3.

Kanwar, J.S (1970), The Role of Machinery in Modernization of Agriculture, Indian Farming, Vol.XIX, No.11.

Krishna, G (1992), The Concept of Agricultural Development in Noor, M (ed.), Dynamics of Agricultural Development, Vol.7, pp.29-36.

Losch, A (1954), Dierauliche Ording Deriwins Witschalf, Jena Fischer, Trans. By Woglom, W.H and Stopler, W.F., The Economics of Location, New Haven, Yale University.

Mallick, S.C (1976), Marketing of Rice in Orissa, Ph.D Thesis, Orissa University of Agriculture and Technology.

Mirchandani, R.T and Hiranandani, G.J (1963), Regulated Markets: Their Review and Impact on Market Structure and Efficiency, Seminar on

Marketing of Agricultural Commodities, Indian Society of Agricultural Economics, Bombay.

Mohammad, N (1981), Technological Change and Diffusion of Agricultural Innovation, Perspective in Agricultural Geography, Vol.IV, P.267, New Delhi.

Mukerjee, A.B (1954), The Bi-weekly Market at Modinagar, Indian Geographer, Vol.2, pp.271-293.

Narasimha, M.G (1988), Regulated Markets in a Rural Economy, Ajanta Publications, Delhi.

Patnaik, N (1953), Study of the Weekly Market of Barpali, Geographical Review of India, Vol.15, No.1, pp.19-31.

Pawar, C.T and Lokhande, T.N. (2000), Spatial Distribution of Market Centers in Kolapur District Maharashtra, Geographical Review of India, Vol. 62, No.1, pp.71-80.

Radhakrishnan, V (1971), Marketing of Cash Crops: With Special Reference to Groundnut and Cotton in Khandesh, Ph.D Thesis, University of Bombay.

Rajpati, R (1989), Agricultural Development and Planning in India, Criterion Publications, New Delhi.

Rao, S.K (1971), Inter Regional Variations in Agricultural Growth, Economics and Political Weekly, Vol.VI, No.27.

Raza, M (1978), Levels of Regional Development in India, Indo-Soviet Symposium on Regional Development and National Planning, Tiblisi.

Saxena, H.M. (1992), Regulated Agricultural Markets-A Case Study of Rajasthan, Rawat Publications, Jaipur, Delhi

Saxena, H.M (2003), Marketing Behavior A Regional Analysis, R.B.S.A. Publishers, Jaipur.

Shafi, M (1981), Increasing our Agricultural Production, *The Geographer*, Vol.28, No.1, pp.1-8.

Sharma, O.P (1999), Regulated Market as a Focal Point of Economic Development: A Case Study of Mohibullapur Mandi Lucknow, in 'Commercial Activities and Development in the Ganga Basin, Shrivastava, V.K. (eds), Vol.46, No.2, pp.269-283

Sharma, S.K and Singh. D (2003), Spatio-Temporal Trend of Marketing of Agricultural Produces in Madhya Pradesh, *The Geographer*, Vol.50, No.1, pp.74-85

Siddiqui, Z., Khan, N and Hoda, M.M (2003), Role of Regulated Market in the Development of Vegetable Cultivation in North India: A Case Study, *The Geographer*, Vol.50, No.1, pp.86-107

Singh, A.L and Fazal, S (1994), Marketing of Agricultural Produce by the Farmers in Upper Ganga-Yamuna Region, India, *The Geographer*, Vol.XLI, No.1.

Singh, L.P (1983), Regulated Markets in India, Capital Publishers, Delhi.

Singh, G.N., Singh, D.S and Singh, R.I (1987), Agricultural Marketing in India, Chugh Publications, Allahabad, India.

Siva Rama Prasad, A (1982), Management of Regulated Markets "A Study of Organizational Performance of Selected Regulated Markets in Andhra Pradesh, Ph.D Thesis, Andhra University, Wattair.

Skinner, G.W (1965), Marketing and Social Structure in Rural China, Journal of Asian Studies, Vol.24, pp.3-45.

Smith, R.H.T (1972), "The Synchronization of Periodic Market" in W.P.Adams and F.M.Halleiner (eds), International Geography, Vol.1, pp.591-593, Toronto.

Subba, R.K (1978), Rice Marketing System and Compulsory Levies in Andhra Pradesh, Allied Publishers Private Limited, Bombay.

Symnaski, R (1974), Complex Periodic Market Cycle, Annals of Association of American Geographers, Vol.64, pp.203-213.

Thakur, A (1992), Patterns of Agricultural Growth in Noor, M (ed.), Dynamics of Agricultural Development, Vol.7

Thorpe, D and Nader, G.A (1967), Customer Movement and Shopping Centre Structure: A Study of Central Place System in Northern German, Regional Studies, Vol.1, pp.173-191.

Vance, J.E.Jr (1970), The Merchants World, The Geography of Wholesaling, New Jersey.

Zaibun, Y.Jasdanwalla (1966), Marketing Efficiency in Indian Agriculture, Allied Publishers Bombay.

CHAPTER-2

ALIGARH DISTRICT: A GEOGRAPHICAL OUTLOOK

2.1 Location

Aligarh district is located in the western part of Uttar Pradesh. It lies between latitudes 27° 34' N to 28° 11' N and between longitudes 77° 29' E to 78° 38' E in the central part of Ganga–Yamuna *doab*. It is bounded by the district of Bulandshahr in the north, Mathura in the west and south west, Hathras in the south and Etah in the east. The extreme north eastern boundary formed by the river Ganga, separates the Badaun district from Aligarh whereas the extreme north-western boundary, formed by the river Yamuna, separates Aligarh from Gurgaon district of Haryana state (Fig.2.1).

The district has a total area of 3700 sq.kms with a population of 2992286 persons in 2001. The maximum extent of the district from east to west is 116 Kms and the maximum extent from north to south is about 62 kms. With the carving out of a large part of Aligarh district in 1998 to form the newly created district of Hathras, the shape of Aligarh district is now dominated by an east west protrusion. From the administrative point of view, the district has been divided into 5 *tehsils* namely, Atrauli, Gabhana, Khair, Koil and Iglas. These *tehsils* are further subdivided into 12 development blocks namely, Atrauli, Gangiri, Bijauli, Jawan, Chandaus, Khair, Tappal, Dhanipur, Lodha, Akrabad, Iglas and Gonda, which include 1181 villages (Fig and Table 2.1).

The district of Aligarh forms a part of Ganga-Yamuna *doab*. Opinions regarding the age of this *doab* vary widely. Thus according to Edward Suess, it is a fore deep formed in the front of the resistant mass of the peninsula when the Tethyan sediments were thrusted south west and compressed against them[1]. Sir Sydney Burrad considered it to be a rift valley bounded by parallel faults on either side[2]. The third view regards it as a sag in the crust formed between northward drifting Indian continent and the comparatively soft sediments accumulated in the Tethyan basin when the latter were crumpled up and lifted up into a mountain system[3].

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1 Suess, E. (1904–24), The Face of the Earth, Oxford, Vol. 5.

2 Burrad, S.S. (1915), Origin of the Gangetic Trough Commonly Called the Himalyan Force–deep, Proceeding Royal Society London, Vol. 19–A, pp. 220–238.

3 Krishnan, M.S. (1956), Geology of India and Burma, Madras, p. 511.

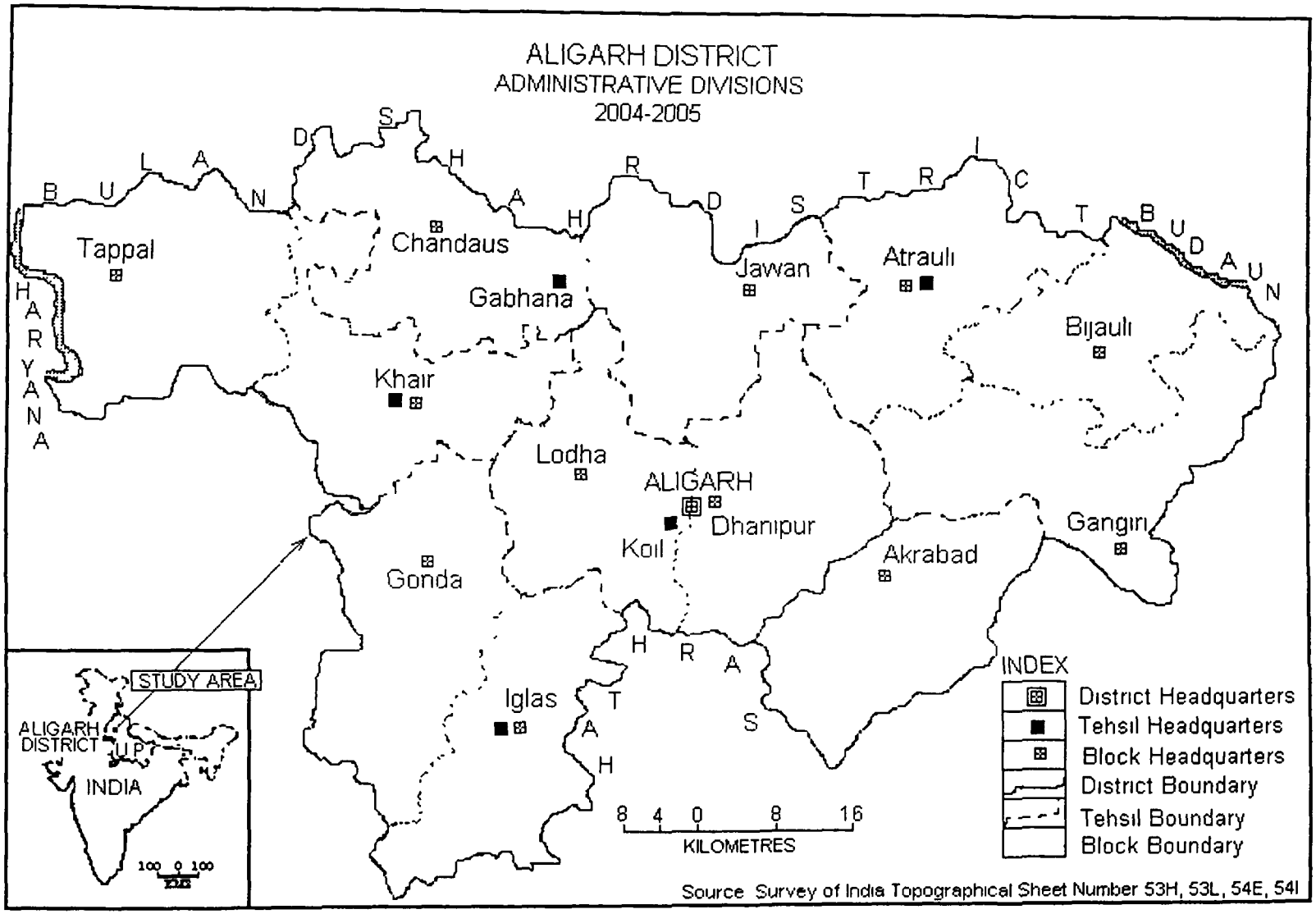
ALIGARH DISTRICT
ADMINISTRATIVE DIVISIONS
2004-2005
BULANDSHAHR DISTRICT
HARYANA
Tappal
Chandaus
Gabhana
Jawan
Atrauli
Bijauli
Khair
Lodha
ALIGARH
Dhanipur
Koil
Gonda
Akrabad
Gangiri
Iglas
HATHRAS
STUDY AREA
ALIGARH DISTRICT U.P.
INDIA
100 0 100
KILOMETRES
8 4 0 8 16
INDEX
District Headquarters
Tehsil Headquarters
Block Headquarters
District Boundary
Tehsil Boundary
Block Boundary
Source Survey of India Topographical Sheet Number 53H, 53L, 54E, 54I

Fig 2.1

Table 2.1 Administrative Division of Aligarh District

S.N	Tehsils	S.N	Blocks	Number of Villages
1.	Atrauli	1.	Atrauli	113
		2.	Gangiri	99
		3.	Bijauli	82
2.	Gabhana	4.	Jawan	109
		5.	Chandaus	91
3.	Khair	6	Khair	96
		7.	Tappal	88
4.	Koil	8.	Dhanipur	99
		9.	Lodha	135
		10.	Akrabad	84
5.	Iglas	11.	Iglas	102
		12.	Gonda	83
	Total		Total	1181

Source: Based on Information Supplied by District Statistical Office, Aligarh 2004.

Another view held at present, is that it has been formed by the buckling down of northern border of the peninsular shield beneath the sediments thrust over it from the north[1]. Stratigraphically, the Ganga Yamuna *doab* is built up of layers of sands and clays filling up a deep depression between the peninsula and the Himalayas. As far as the thickness of the sediments overlying the *doab* is concerned, different estimations have been made. Oldham estimated the depth of sediments in *doab* between 4000–6000m[2].

2.2 Physical Profile

2.2.1 Relief

The topographic feature of Aligarh district is similar to those found in other parts of the Ganga–Yamuna *doab*. Physiographically the district contains vast alluvial plains, having a gentle slope from north to south and south east and is drained by the river Ganga in the north east and Yamuna in the north west (Fig. 2.2).

From the low *khadar* of the river in the east, the level of the district rises sharply to the high uplands which crown the old flood bank of the river Ganga

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1 Ibid

2 Oldham, R.D. (1971), The Structures of Himalayas and the Gangetic Plains, Memoirs of Geological Survey of India, Vol. 42, No. 2, pp. 1–153.

then descends inland gradually to a depression, drained by 'Neem' and 'Chhoiya' rivers. Beyond this, it rises against the bank of river 'Kali'. Along the bank of the river Kali is another sandy to silty belt rising from the low and narrow *khadar* belt of that stream. Adjoining it is a fertile belt of loam soil, which sinks gradually into the broad central depression.

Through the centre of the district, a broad belt of low lying land runs from north west to south east. This broad low lying belt runs from the district of Meerut, passing through the Ghaziabad and Bulandshahr districts, enters Aligarh district from Gabhana *tehsil* in the north. The depression is narrow in the north and gets wider towards the south and it eventually passes into the adjoining district of Etah. It is believed to be a part of a very extensive lowlying tract which runs through the entire area of the *doab* parallel to the rivers Ganga and Yamuna. This tract is characterized by imperfect drainage and numerous *jhils* in which the surface water collects.

Beyond this depression, the surface rises again into wide level plains known as western uplands. In the north-west, the general characteristics of the *doab* are maintained, loam alternating with clay in the depressions and with lighter ground on the banks of the new drainage channels, till finally comes the high cliff of the Yamuna. From here, the level drops to the *khadar* of Yamuna. In the south west of the district are found sandy tracts, with practically no depressions.

Topographically the district represents a shallow trough like appearance. On the basis of topography the district may be divided into three broad divisions.

(1) The *Khadar* plains found mainly along the river Ganga in the east and along the river Yamuna in the west.

(2) The eastern and western uplands.

(3) The central low lying tract.

However, the district, in all physiographic regions, is overlain by thick sediments. The thickness of sediments in this area is very much debatable matter. Central Ground Water Board Lucknow (1978) has indicated that the real thickness of the alluvial deposits at Aligarh is only 379.5 metres.

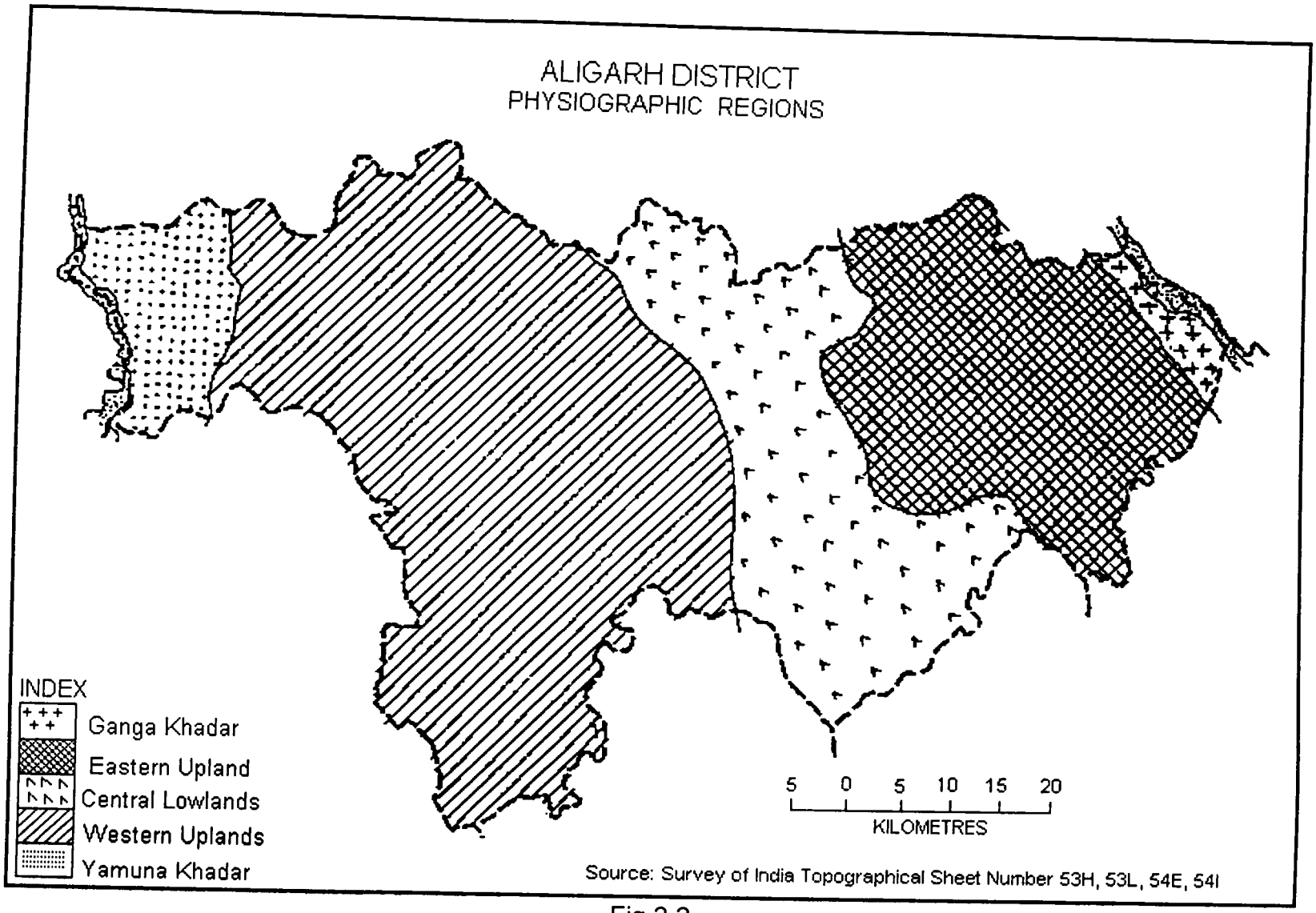
ALIGARH DISTRICT
PHYSIOGRAPHIC REGIONS
INDEX
Ganga Khadar
Eastern Upland
Central Lowlands
Western Uplands
Yamuna Khadar
5 0 5 10 15 20
KILOMETRES
Source: Survey of India Topographical Sheet Number 53H, 53L, 54E, 54I

Fig 2.2

A more recent report by the Hydrological Department of Uttar Pradesh (1984), also believes that the alluvium comprising of sand, silt and clay extends down to a depth of 286.69 metres.

The alluvial deposit is divided into two distinct land features i.e. *bhanger* and *khadar*. The *bhanger* lands are older alluvium and correspond in age to middle pleistocene period, while *khadar* lands are newer alluvium. The *bhanger* lands occupy the higher ground, forming small plateaus in the interior areas, above the general flood levels of the main rivers and their tributaries. Where as the *khadar* lands, newer in age, form the flood plains along the river bank. The most important material in *bhanger* lands is clay which at places becomes loam to sandy loam and colour of these lands is rather dark, *khadar* deposits of various shapes and sizes are also found. Another characteristic of *bhanger* lands is that large areas of rich agricultural tracts have become unsuitable for cultivation due to the presence of *reh*. The *khadar* lands of the district are confined to the vicinity of the rivers Ganga and Yamuna. These lands are composed of sand, silt and clay. They are of light colour and generally poor in calcareous matter.

2.2.2 Drainage System

Rivers Ganga and Yamuna form the eastern and western boundaries of the district for small distances, their respective length being about 15 and 20 kilometers. Nevertheless, the drainage pattern of the district is governed by these two mighty rivers which form the *doab* and receive the water of all the small rivers which traverse through the district to join either of these two beyond the boundaries of the district. Tributaries of river Yamuna which run through the central and the western parts of the district, command a larger catchment area as compared with the tributaries of river Ganga, which run through the eastern parts. A remarkable difference between the tributaries of river Ganga and Yamuna is to be noted in the general direction of their flow in the district. The tributaries of river Yamuna flow from north to south within the district, while the tributaries of river Ganga flow a south easterly course (Fig. 2.3).

The Ganga River

Ganga river having its source in the snowcaps of the Himalayas, enters the great plain at Hardwar from there it flows southwards upto Bulandshahr and then it enters into Aligarh and takes a south easterly direction separating Aligarh from Badaun. The most striking feature of the Ganga is the changing nature of the stream. However, the changes in the course have been reduced to a considerable degree with the construction of the lower Ganga canal at Narora.

The Yamuna River

Yamuna is one of the important tributary of the Ganga. River Yamuna has its source in the snowy peaks of the Himalayas. It moves along the north western border of Aligarh and then it flows towards the south into Mathura and Agra district.

Sengar

Sengar is a tributary of river Yamuna and rises in Aligarh district and flows in a north south direction upto the southern border of the district. Sengar is usually dry during the summer months, due to scanty supply of water. The river is not useful for irrigation purposes.

Rind

River Rind or Arind rises in the low lands of Aligarh and moves southward following a southeasterly direction. It is a seasonal stream and its bed is almost dry in cold and hot months but during the rainy season it becomes a river of considerable magnitude. It occupies a shallow alluvial bed which provides a good yield of grain crops with little irrigation in ordinary years.

Karon

River Karon or Karwan, as it is known in some parts, flows in a north south direction and passes through Khair, Iglas, and Hathras tehsils. It flows in a north south direction. It flows southwards in the district and passing through Mathura and joins the river Yamuna near the city of Agra.

Kali

River Kali properly known as river Kalindari, rises in Muzaffarnagar and moving southwards through the districts of Meerut and Bulandshahr, enters into Aligarh.

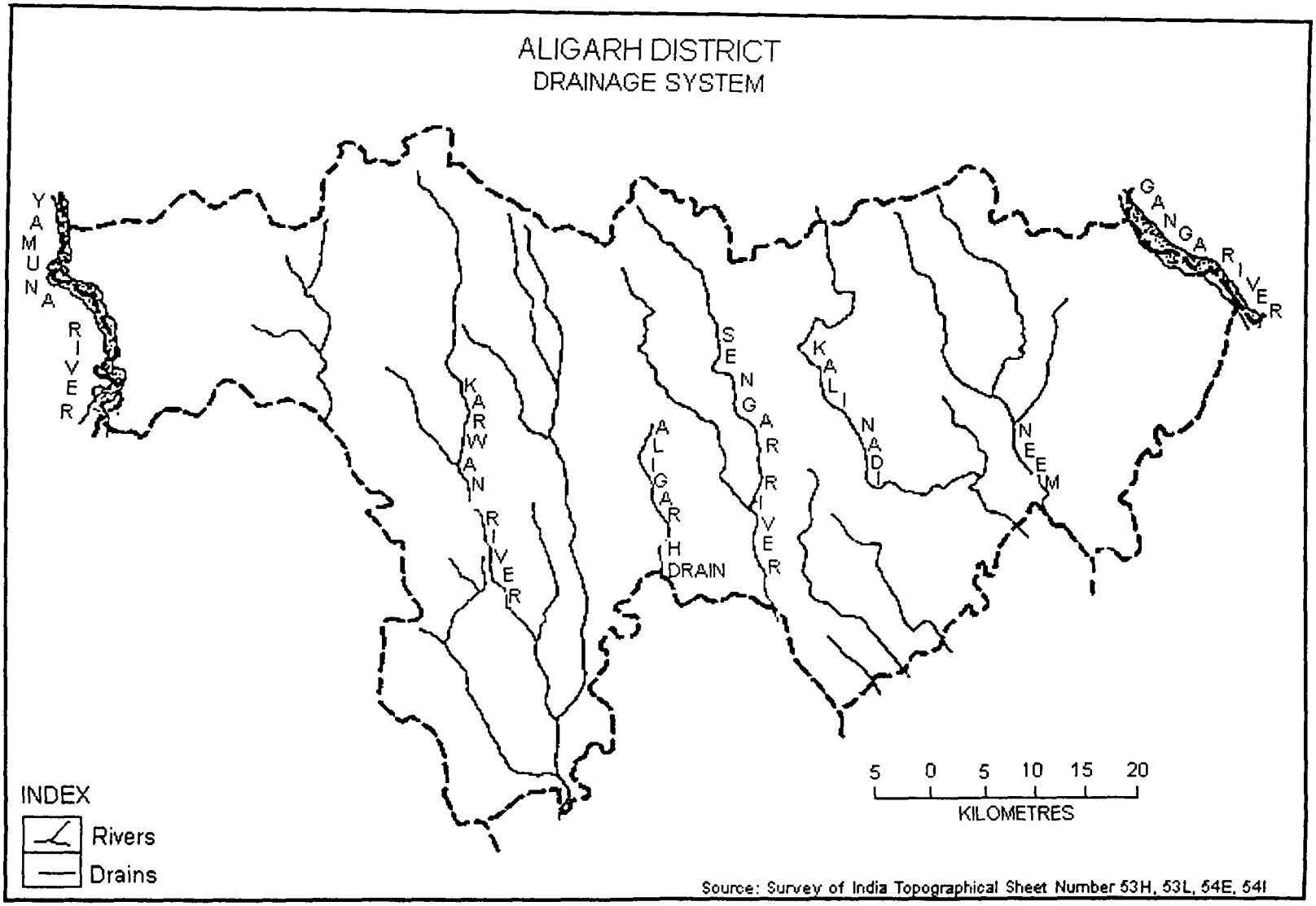
ALIGARH DISTRICT
DRAINAGE SYSTEM
YAMUNA RIVER
KARWAN RIVER
ALIGARH DRAIN
SENGAR RIVER
KALI NADI
NEEM
GANGA RIVER
INDEX
Rivers
Drains
5 0 5 10 15 20
KILOMETRES
Source: Survey of India Topographical Sheet Number 53H, 53L, 54E, 54I

Fig 2.3

It takes southerly course and separates Atrauli *tehsil* from Kol and Sikandra Rao *tehsils*. Kali nadi is a perennial river and runs through a narrow valley marked by high banks. During the hot season it is not a very important river, but during the rainy months it becomes a river of considerable importance, when it overflows its bank leaves some deposits of alluvial silt.

Neem

River Neem, a small stream rising from north, joins Kali nadi on its left bank. It is seldom dry in hot season and overflows during the rainy season. The bed of this river has been deepened to improve drainage and its water is used for irrigation purpose. In the upper course it contains a broad basin with the low lands on both the sides.

2.2.3 Climate

Climate is an important unit of physical environment which influences human life and culture in any geographical region. Climate determines where man may live and thrive, what crops he may raise, what type of home he may appropriately build, what sort of clothing he needs, and what pests and diseases he must combat. A study of the factors of the climate and the rhythm of seasons in the district, therefore, assumes great significance in understanding the process of agricultural production and their marketing system. The climate of Aligarh district is a typical monsoon type of climate characterized by semi-arid condition. Generally the year is divided into the following four seasons.

(a) Cold Weather Season (mid November to February.)

(b) Hot Weather Season (March to mid June)

(c) Season of General Rains (mid June to September.)

(d) Season of Retreating Monsoon (October to mid November)

The Cold Weather Season

The season starts from mid November and the whole district comes under the influence of the high pressure belt which develops over north India owing to low temperatures. In this season relatively low pressure exist over the Indian ocean thus causing the winds to blow from the plain towards the sea. The beginning of the cold weather is marked by a considerable fall in

temperature. The mean monthly temperature falls from 20° C in November to 16.1° C in December. The temperature shows a further fall in January when the average is 15° C. The diurnal range of temperature during the winter months is high, making the nights cold while the days are relatively warm.

The prevailing directions of winds during the season are from west and northwest to east and southeast. The winds during the season are very light and generally blow at the average speed of 2.3 kms per hour in Aligarh.

An exception to the prevailing fine weather is the occurrence of winter rains brought about by the cold weather storms. The amount of rainfall caused by these disturbances is small, irregular and sporadic. The total rainfall during December, January and February are 9.7 cm, 1.65 cm and 1.30 cm. respectively. Hailstorms which are sometimes accompanied by the cold weather storms may cause great injury to the flowering plants. However, the area affected by a hailstorm is almost small and within the area it affects in uncontinuous manner, such as, one field is severely damaged, while a few yards away other field is almost untouched.

The Hot Weather Season

This season begins in March and continues till Mid–June. The mean maximum and minimum temperature in March are 30.7° C and 14.9° C respectively. The temperature continues to rise in April when the respective maximum and minimum for the month are 41.7° C and 15.6° C. The months of May and June record exceptionally high temperatures. The mean maximum temperature rises to 45° C in both months. Temperature rising above 46.1° C on some hot days during May and June are not uncommon. The hot days are characterized by intense heat, and dry air, with low humidity as low as 24 per cent. In the summer months dry winds of great velocity are a regular phenomenon. The velocity of these winds begins to increase steadily from March when the average wind speed is about 5.5. kms per hour.

A peculiar phenomenon of the hot weather is the occurrence of dust and thunderstorms which are caused by the convective currents. They usually occur in the afternoon when the air movement is strongest. Their frequency and

strength increases with the advances of the season. There is generally no rain during the summer months except for the small amount accompanied by the thunderstorms. This, too, is sporadic, short lived and highly variable in its amount and incidence. This however, is of little concern to the cultivators, as the precipitation during this period has little agricultural value.

The Season of General Rains

By the middle of June, a change occurs in the weather which is called the burst of monsoon. The mean monthly temperature falls from 35° C in June to 31.7° C in July. The relative humidity increases from 27 per cent in may to 74 per cent in July. The sky is generally overcast in the rainy season. The time of onset and retreat of the monsoon varies from year to year. The rain generally sets in by the middle of June and continues till the end of the September. The average annual rainfall for the entire district is about 65 cm out of about 90 per cent of the total annual rainfall. The rain diminishes in September and gradually ceases by the end of this month. The incidence of rains during the end of the months is of special value to agriculture.

Season of Retreating Monsoon

The southwest monsoon ends by the end of September, or by the beginning of October. Usually this monsoon retreats gradually and September experiences a hot and sticky weather with a distinct rise in temperature which however, comes down by the end of October. During this period, the skies are clear and relative humidity falls to 47 per cent. However by the end of October, the humid oceanic currents are replaced by the dry continental air. This period is considered a transitional phase between the hot wet weather and cool dry weather. Temperature during this season is uniformly high, about 26° C in the beginning of October, but by November it begins to decrease more sharply and a cool weather sets in by December, during which the whole area comes under the influence of the northeast monsoon.

2.2.4 Soils

Aligarh district is located in the upper Ganga plain, where the soil is mostly alluvium. It is generally placed into two broad groups i.e., old and new

alluvium. The new alluvial deposits are found in the flood affected plains of the rivers and their tributaries, while the old alluvial deposits are found above the flood level of the main rivers and their tributaries. These types of soils are quite productive and useful for the agriculture of the region. These soils differ considerably in their texture and consistency, ranging from sands through loams and silts to heavy clay that are ill drained, and sometimes charged with injurious salts known as *reh*. Good soil tracts are usually parallel to the rivers of the area. Along the Ganga in the east, soils vary from sandy to sandy loam and clayey loam up to middle parts of the district. Further, westwards there is again the sandy loam tract which finally merges into the sandy bed of the river Yamuna. There are following four areas having different soils in the district (Fig. 2.4).

(1) The sandy soil tract
(2) The sandy loam soil tract
(3) The loamy soil tract
(4) The clayey loam soil tract

The Sandy Soil Tract

The sandy tract is located along both sides of river Ganga and Yamuna. This type of soil varies in texture and structure. The colour of the soil varies from light gray to ash gray. The ground water table is usually near the surface and during the monsoon months it remains virtually on the surface itself. Agriculture in the *khadar* soil is precarious but whenever cultivation is possible good crops are raised. Sugarcane is also grown on these soils. However, it accounts for a very small portion of the total cultivated land.

The Sandy Loam Soil Tract

The sandy loam soil is spread over a sizeable area of the district. The soil is more leached than other soils of Aligarh district, because the annual rainfall in this region is more than in other region. This type of soil occurs in the entire Atrauli *tehsil* with the exception of narrow depression in the south and near the Ganga river.

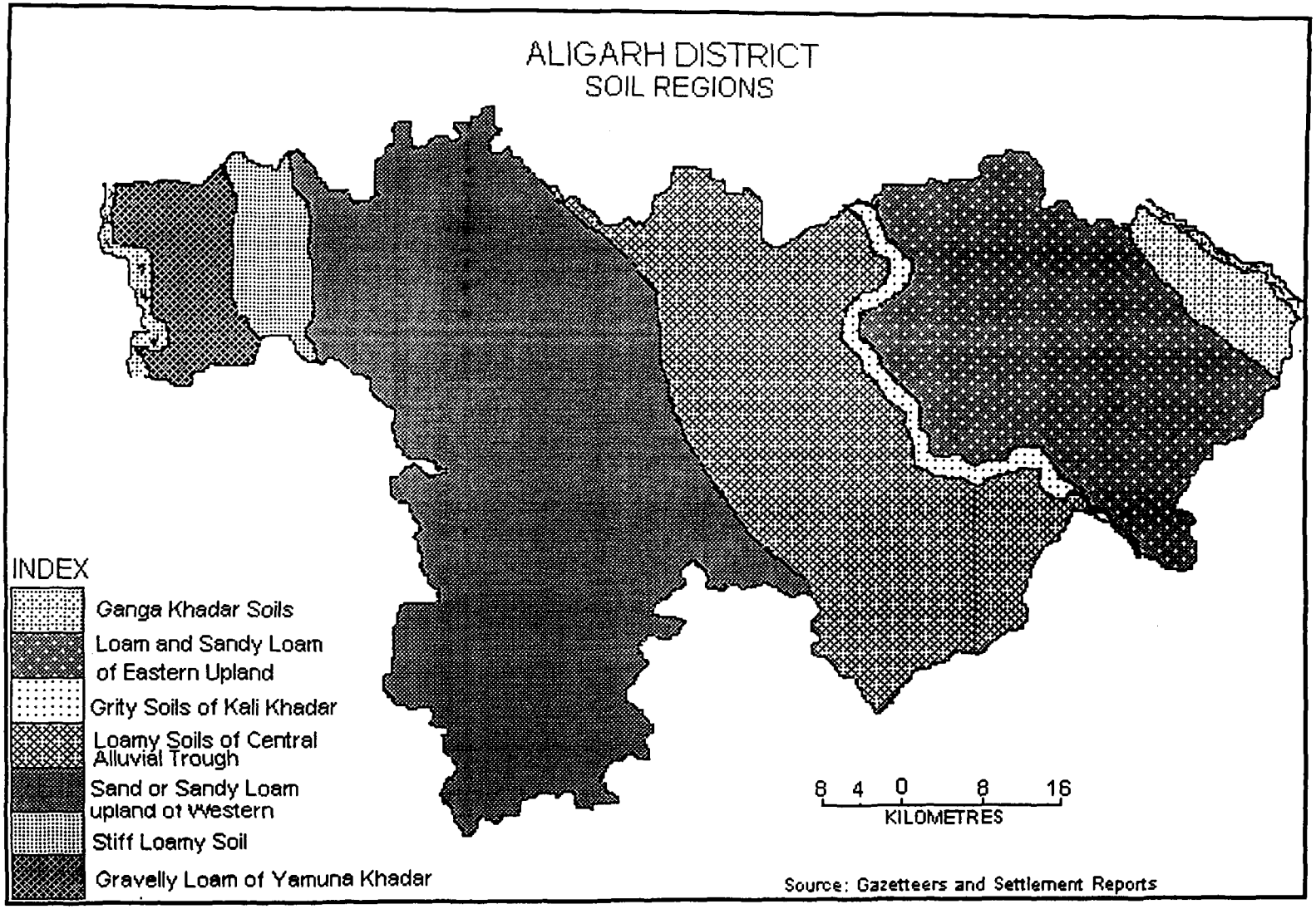
ALIGARH DISTRICT
SOIL REGIONS
INDEX
Ganga Khadar Soils
Loam and Sandy Loam of Eastern Upland
Grity Soils of Kali Khadar
Loamy Soils of Central Alluvial Trough
Sand or Sandy Loam upland of Western
Stiff Loamy Soil
Gravelly Loam of Yamuna Khadar
8 4 0 8 16
KILOMETRES
Source: Gazetteers and Settlement Reports

Fig 2.4

The soil is generally sandy in texture and is brown or redish in colour. Water table is very low, going at places 50 feet from the surface. The pH varies from neutral to slightly alkaline. (Fig 2.4)

The Loamy Tract

The loamy tract is found between the *khadar* lands of the river Ganga and Kali nadi. The surface texture varies from good quality loam to sandy loam. The soil of this tract is very fertile. The soils are light brown to brown and at places dark brown in colour with marked alluviation of clay towards the bottom. The sub-soils being comparatively heavier retain large quantities of water. The common crops of the area cultivated in this soil type are millets and maize during the *Kharif.* Mixed cropping of *bajra* and *arher* is also prevalent. The common *rabi* crops are barley and wheat, the former slightly more liked by cultivators (Fig 2.4).

The Clayey Loam Soil Tract

This type of soil runs from the north to south, generally parallel to the course of the river Ganga. The drainage in this tract is bad and in the monsoon months parts of it suffer from water logging. The tract is underlied by a thick pan of *Kankar.* occurring in mild cases in the form of nodules which at places cement together forming a stiff impenetrable rock in the bottom layers. This type of soil is sticky and generally clayey or clayey loam in texture. It is gray, ash gray, or dark gray in colour tending to become black when moist on sandy elevated tracts. Peas are also successfully grown on these soils (Fig 2.4).

2.2.5 Natural Vegetation

The natural vegetation of a region is important in many ways. It protects our agriculture land by conserving soil and water. It also provides essential raw materials for forest based industries and is a safeguard against flood and soil erosion. However, in the study area most of the forests have been cleared for the cultivation crops. The forest cover occupies a very small percentage of total study area. It accounts only 6.87 per cent of total geographical area of the district. There is hardly any forest cover area in the district. The block-wise distribution of area under different forests shows an uneven character (Fig 2.5).

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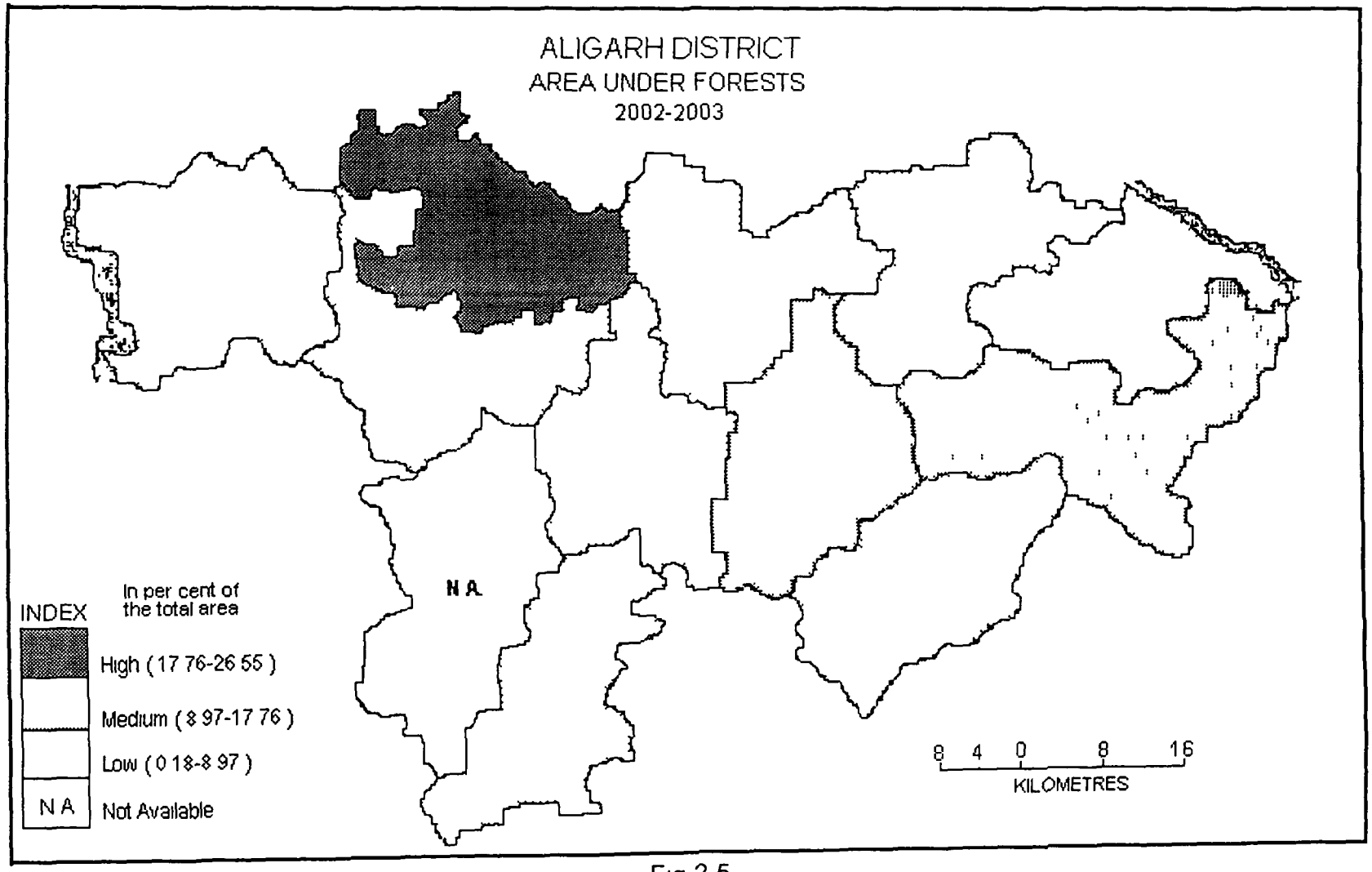

ALIGARH DISTRICT
AREA UNDER FORESTS
2002-2003
N A
INDEX
In per cent of the total area
High (17 76-26 55)
Medium (8 97-17 76)
Low (0 18-8 97)
N A
Not Available
8 4 0 8 16
KILOMETRES

Fig 2 5

Table-2.2 Area under Forests in Aligarh District (2002-2003)

S.N	Blocks	Area (in hectares)	% of Total Reported Area
1	Atrauli	5	0.17
2	Akrabad	93	3.27
3	Bijauli	11	0.45
4	Chandaus	886	26.55
5	Dhanipur	260	10.26
6	Gangiri	348	10.21
7	Gonda	N.A	N.A
8	Iglas	11	0.43
9	Jawan	64	2.23
10	Khair	252	7.84
11	Lodha	158	5.63
12	Tappal	196	5.04
	Total	**2244**	**6.87**

Source: District Statistical Magazine 2004

The highest concentration of forests i.e., about 26.55 per cent of total is found in the block of Chandaus, while the lowest concentration of forest i.e., around 0.17 per cent is found in block Atrauli (Table 2.2). Mango groves and other trees are seen in the eastern part of the district.

Some steps have been taken by the canal authorities for plantation of valuable species along the canal and their tributaries. The natural vegetation are the grooves of trees such as *neem, babul, pepal* etc. found in and around the villages. These groves are often accompanied by a number of trees, weeds and more or less useful bushes and trees. These bushes and the thatch grass called 'kens' are found in different riverine stretches.

2.3 Demographic Profile

2.3.1 Growth of Population

In 2001 the district Aligarh had total population of 2992286 persons. Table 2.3 shows that except in 1911, 1921 and 1991 there has been a rapid increase in population of Aligarh district since 1901. The greatest increase was however recorded during the decade 1991-2001 when the population increased by more than 22 per cent, while the lowest population growth was recorded in 1901-1911, 1911-1921 and 1981-1991 that was -2, - 8 and -4 per cent.

The block-wise population growth rate during 1991-2001 varies between maximum of 25.31 per cent in Lodha to minimum negative growth of 9.03 per cent in Tappal block. Lodha, Iglas and Dhanipur blocks recorded the highest growth rate, which is more than that of other parts of Aligarh district.

Table- 2.3 Growth of Population in Aligarh District (1901-2001)

Year	Total Population	Decadal Variation	Growth (%)
1901	1200822	-	-
1911	1165680	-35142	-2.92
1921	1061745	-103935	-8.91
1931	1171745	+110000	+10.36
1941	1372641	+200896	+17.14
1951	1543506	+170865	+12.44
1961	1765275	+221769	+14.36
1971	2111829	+346554	+19.63
1981	2574925	+463096	+21.92
1991	2449597	-125328	-4.86
2001	2992286	+542689	22.15

Source : Census of India Report -1901, 11,21, 31, 41, 51, 61, 71, 81, 91 and 2001

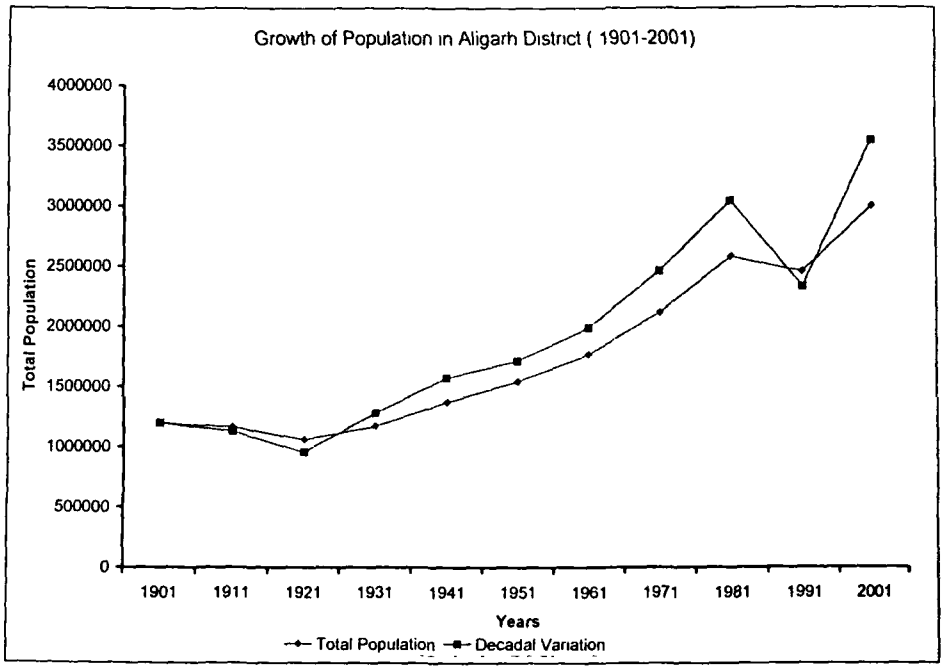


Fig 2.6

The percentage growth of population in decreasing order with Lodha reporting 25.31 per cent, Iglas 21.95 per cent, Dhanipur 21.22 per cent, Gonda 20.55 per cent, Jawan 19.98 per cent, Akrabad 18.43 per cent, Chandaus 17.47 per cent, Bijauli 17.11 per cent, Gangiri 15.83 per cent, Khair 15 per cent, Atrauli 10.09 per cent and Tappal recorded a lowest growth of 9.03 per cent during the same period.

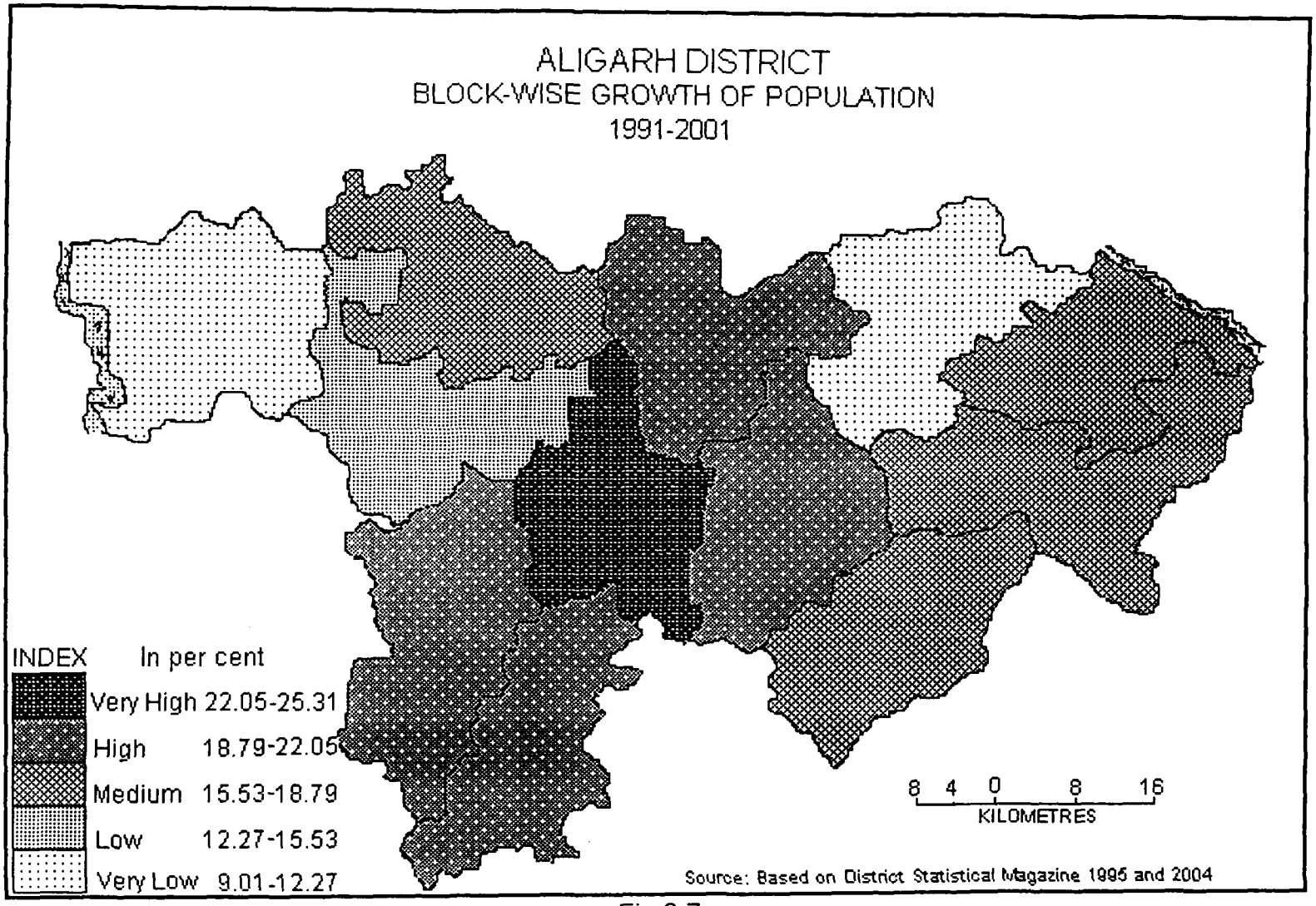

ALIGARH DISTRICT
BLOCK-WISE GROWTH OF POPULATION
1991-2001
INDEX In per cent
Very High 22.05-25.31
High 18.79-22.05
Medium 15.53-18.79
Low 12.27-15.53
Very Low 9.01-12.27
8 4 0 8 16
KILOMETRES
Source: Based on District Statistical Magazine 1995 and 2004

Fig 2.7

Table 2.4 Block-wise Growth of Population in Aligarh District (1991 to 2001)

S. N	Blocks	Population			Growth in Percentage
		2001	1991	Variation	
1.	Akrabad	145040	122466	22574	18.43
2.	Gangiri	227328	196257	31071	15.83
3.	Bijauli	155285	132593	22692	17.11
4.	Atrauli	180899	164313	16586	10.09
5.	Jawan	211390	176187	35203	19.98
6.	Dhanipur	175008	144371	30637	21.22
7.	Lodha	200642	160114	40528	25.31
8.	Chandaus	174333	148406	25927	17.47
9.	Khair	166015	144360	21655	15.00
10.	Tappal	169705	155646	14059	9.03
11.	Gonda	166915	138455	28460	20.55
12.	Iglas	155032	127126	27906	21.95
	Total Rural	2127592	1810294	317298	17.52
	Total Urban	8646.94	639303	225391	35.25
	Total District	2992286	2449597	542689	22.15

Source: District Statistical Magazine, 1995 and 2004.

2.3.2 Distribution and Density of Population

Fig 2.7 shows the distribution and density of population in Aligarh district. It clearly indicates that there is considerable contrast in the number of persons living in different blocks. The main cause of this uneven distribution can be attributed to the existence of uneven distribution in fertile agricultural land, level of urbanization and the facilities of transport and communication.

The density of population is the measurement of population pressure on a given unit of land. The density of the district as a whole is 808 persons per sq.km. Fig 2.8 is based on census data of 2001 shows block-wise density of population. It is seen that only one block namely Gangiri (897 persons/ sq.km) is having high population density, which is above 850 persons per sq.km. After that medium concentration of population is found in blocks Jawan (712 persons/sq.km), Khair (679 persons/sq.km), Iglas (617 persons/sq.km), Dhanipur (624 persons/sq.km) and Chandaus (608 persons/sq.km). While the lowest density of population is found in the blocks of Tappal (598 persons per sq.km), Gonda (594 persons per sq.km), Lodha (588 persons per sq.km), Bijauli (483 persons per sq.km), Atrauli (465 persons per sq.km) and in Akrabad (455 persons per sq.km).

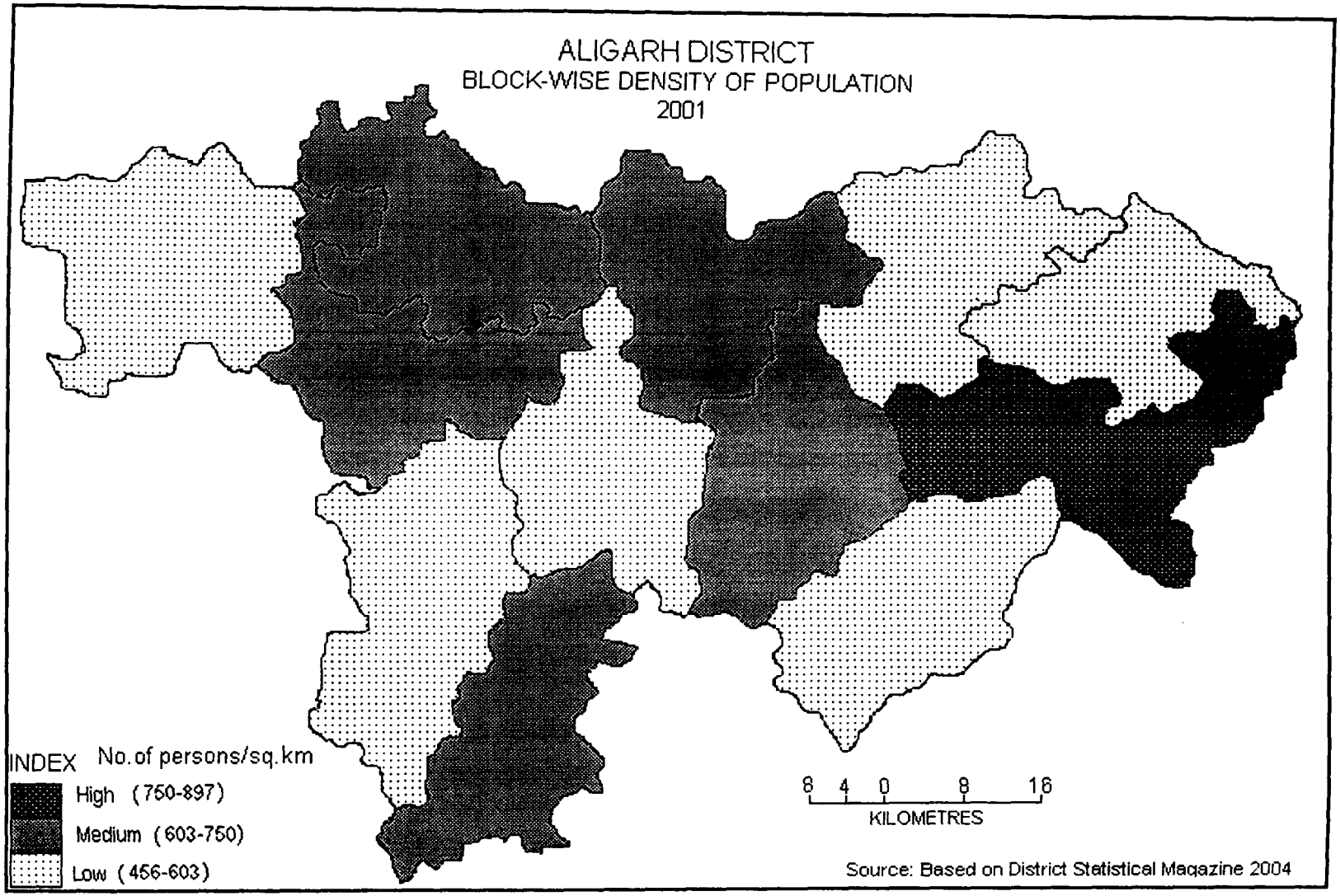

ALIGARH DISTRICT
BLOCK-WISE DENSITY OF POPULATION
2001
INDEX No. of persons/sq.km
High (750-897)
Medium (603-750)
Low (456-603)
8 4 0 8 16
KILOMETRES
Source: Based on District Statistical Magazine 2004

Fig 2.8

Table 2.5 Block-wise Area and Density of Population in Aligarh District

S.N	Blocks	2001	Area (km²)	Density*
1	Atrauli	180889	388.8	465
2	Akrabad	145.40	318.7	455
3	Bijauli	155285	321.3	483
4	Chandaus	174333	286.6	608
5	Dhanipur	175008	280.4	624
6	Gangiri	227328	253.4	897
7	Gonda	166915	280.7	594
8	Iglas	155032	251.1	617
9	Jawan	211390	296.7	712
10	Khair	166015	244.2	679
11	Lodha	200642	340.7	588
12	Tappal	169705	283.7	598
Total		2127592	3546.3	599
Total Rural		2127592	3555.1	598
Total Urban		864694	145.3	5951
Total District		2992286	3700.4	808

Source: District Statistical Magazine 2004 (*per/sq km)

2.3.3 Sex Ratio

The sex ratio of Aligarh district shows a dominance of male population. In 1991 the sex ratio of the district was 842 females per 1000 males compared to 841 in 1981 and 834 in 1971. Many socio-economic factors contribute to the disparity in sex ratio. Block level distribution of sex ratio shows that the highest ratio has been found in Jawan and Khair i.e., 872 and 867, while minimum of 833 females per 1000 males was registered in Bijauli block (Table 2.6). In 2001, the district reported 855 females per 1000 males.

Table 2.6 Block-wise Distribution of Sex Ratio in Aligarh District (2001)

S.No	Blocks	Sex Ratio (per thousand males)
1.	Akrabad	857
2.	Gangiri	854
3.	Bijauli	833
4.	Atrauli	861
5.	Jawan	872
6.	Dhanipur	863
7.	Lodha	849
8.	Chandaus	857
9.	Khair	867
10.	Tappal	866
11.	Gonda	841
12.	Iglas	846
Total Average		855.5

Source: District Statistical Magazine, 2004

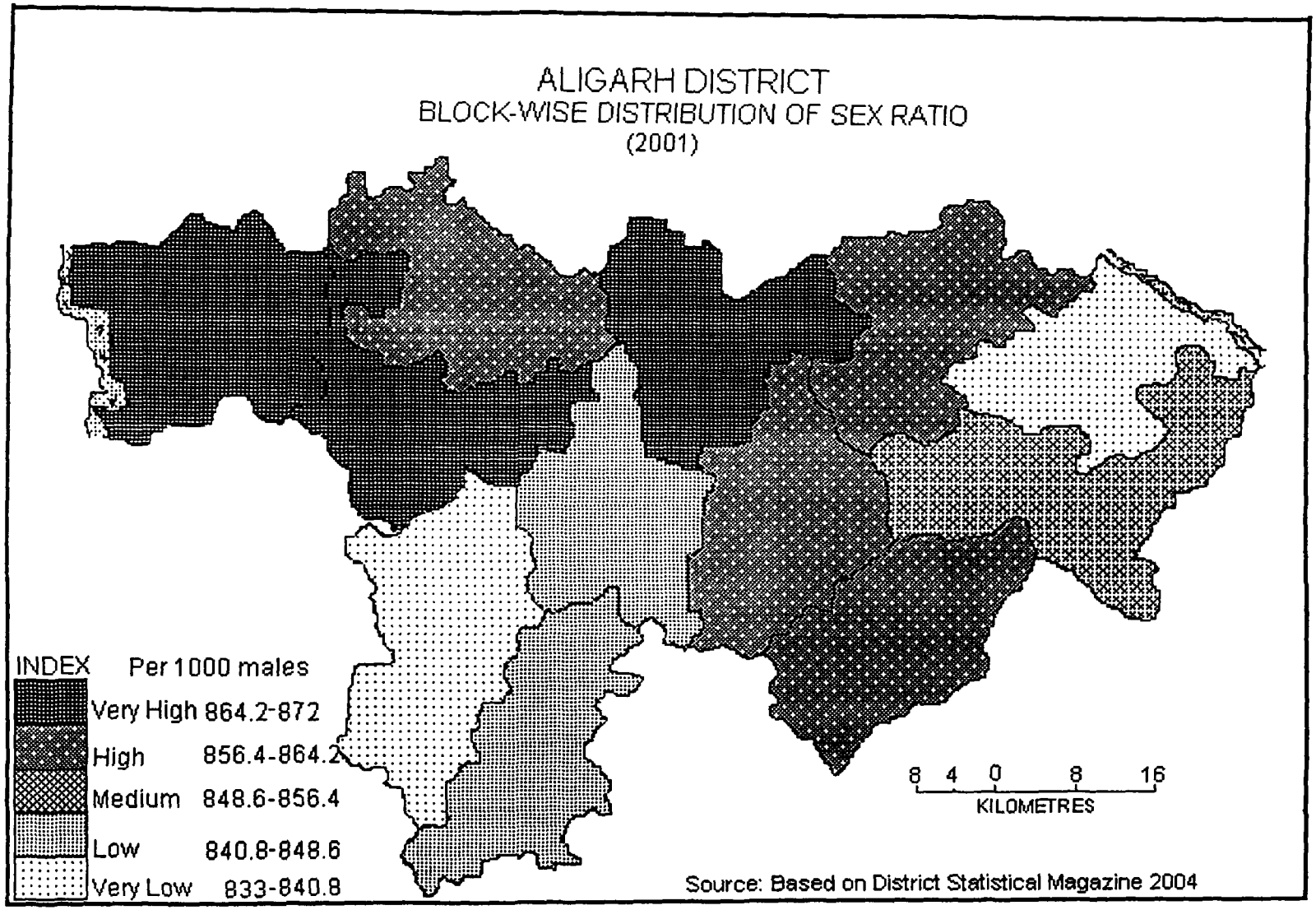

ALIGARH DISTRICT
BLOCK-WISE DISTRIBUTION OF SEX RATIO
(2001)
INDEX Per 1000 males
Very High 864.2-872
High 856.4-864.2
Medium 848.6-856.4
Low 840.8-848.6
Very Low 833-840.8
8 4 0 8 16
KILOMETRES
Source: Based on District Statistical Magazine 2004

Fig 2.9

2.3.4 Literacy

Literacy rate of any area has great significance since it serves as an indicator of the capacity of people to learn and adopt the new techniques and methods of production both in the sector of agriculture and industry, and to live a more healthier, prosperous and active life. The district had registered continuous increase in the literacy rate since 1951. It is reported that in Aligarh district female literacy rate had increased from 4.89 per cent in 1951 to 27.11 per cent in 1991.

Table 2.7 Block-wise Distribution of Literacy in Aligarh District (2001)

S.No.	Blocks	Male	Female	Total
1.	Akrabad	76.59	40.02	59.71
2.	Gangiri	47.47	20.33	34.97
3.	Bijauli	43.93	16.54	31.48
4.	Atrauli	60.90	32.70	47.85
5.	Jawan	39.84	22.79	31.90
6.	Dhanipur	69.28	41.07	56.22
7.	Lodha	74.27	42.91	59.88
8.	Chandaus	45.57	24.55	35.87
9.	Khair	60.48	32.42	47.45
10.	Tappal	61.00	31.00	47.08
11.	Gonda	62.11	33.89	49.22
12.	Iglas	64.26	29.65	48.40
	Total	58.22	30.42	45.40

Source: District Statistical Magazine 2004 (In per cent)

In 2001, the district registered 45.40 per cent literacy rate (Table 2.7), with female literacy of 30.42 per cent and male literacy of 58.22 per cent. Block-wise literacy level shows that Lodha (59.88 per cent), Akrabad (59.71 per cent) and Dhanipur (56.22 per cent) are having the highest literacy rate, while Gonda (42.22 per cent), Iglas (48.40 per cent), Atrauli (47.85 per cent), Khair (47.45 per cent) and Tappal (47.08 per cent), comes in the blocks of medium literacy rate. Chandaus (35.87 per cent), Gangiri (34.97 per cent), Jawan (31.90 per cent), Bijauli (31.48 per cent) are the blocks of lowest literacy rate.

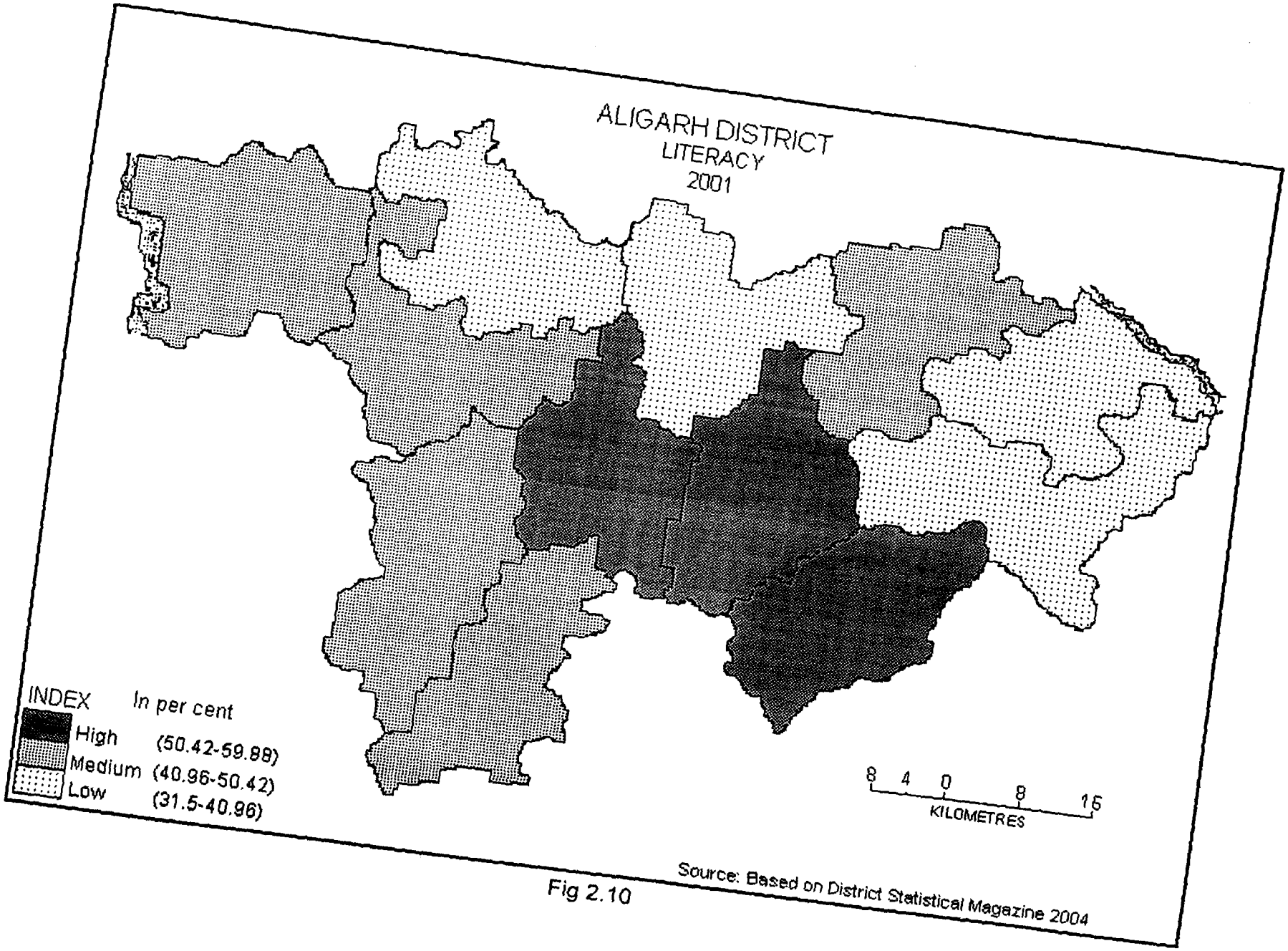

ALIGARH DISTRICT
LITERACY
2001
INDEX In per cent
High (50.42-59.88)
Medium (40.96-50.42)
Low (31.5-40.96)
8 4 0 8 16
KILOMETRES
Source: Based on District Statistical Magazine 2004

Fig 2.10

2.3.5 Occupational Structure

Occupational structure of Aligarh district in 1991 showed that there were 9,02,484 main workers and 84,630 marginal workers, thus taking the total number of workers to 9,87,114. After the formation of Hathras district the number of main workers in the district has been reduced to 6,70,405 persons. Of these about 75.73 per cent live in rural areas while about 24.27 per cent live in urban areas.

Table 2.8 Occupational Structure of Population in Aligarh District, (1991)

Occupational Category	Main workers	
	Number	Percentage
1. Cultivators	279,736	41.73
2. Agricultural labourers	145,093	21.64
3. Livestock, Forestry, Fishing etc	6,948	1.04
4. Manufacturing, other than Household Industry	61,704	9.20
5. Mining	113	0.02
6. Household Industry	16,137	2.41
7. Construction	11,123	1.66
8. Trade and Commerce	52,236	7.79
9. Transport, Storage and communication	15,796	2.35
10. Other Services	81,519	12.16
District Total	**670,405**	**100.00**

Source: District Statistical Magazine 2004

As may be derived from Table 2.8 agriculture continues to remain potentially the most important occupation of the district. It gives employment to about 63.37 per cent of the total workers who are engaged either as cultivators or as agricultural labourers. The second largest occupational category is constituted by workers engaged in other services. They form 12.16 per cent of the total main workers. Manufacturing other than household industry gives employment to about 9.20 per cent of the workers. Trade and commerce provide employment to about 7.79 per cent of the total workers.

2.3.6 Religion

Religion plays an important role in Aligarh for it influences the breeding, education, customs, habits, marriage, profession and the design and structure of the residential houses. Religion has also influenced architecture, as for example mosques grow up in predominantly Muslim localities and temples

in Hindu areas, Gurudwara in Sikh localities and Church in Christian areas. Forming a conspicuous feature in the landscape of the city, Jama Mosque is situated at Upperkot in Aligarh which is in Muslim locality, while temples surround the Achal Tank in Hindu areas of Aligarh town. Hindi and Urdu are the main languages which are spoken in the district.

2.4 Agricultural Economy

2.4.1 Land use

Land use of an area is determined by the nature and general layout of physical elements. Classification of land use (Table 2.9) shows that the net sown area occupies about 80.54 per cent of the total reported area of the district and thus constitutes the most dominant category of land use.

Table 2.9 Land use in Aligarh District, (2000-2001)

S. N	Land use	Area (Lakh hect.)	(Percentage)
1.	Land put to non-agricultural uses	0.34	9.19
2.	Barren and uncultivated land	0.11	3.24
3.	Cultivable waste land	0.07	1.90
4.	Other fallow	0.09	2.43
5.	Permanent pastures and grazing land	0.02	0.54
6.	Forest/groves, trees, crops	0.03	0.81
7.	Current fallow	0.04	1.35
8.	Net sown area	3.00	80.54
District Total Reported Area		7.4	100

Source: District Statistical Magazine 2004 p. 30.

It is followed by the category of land put to non-agricultural uses, which account for 9.19 per cent of the total area. The current and other fallow lands account for 1.35 per cent and 2.43 per cent of the area respectively. Culturable waste land accounts for 1.90 per cent of the reported area. Forests, Trees, groves and crops account for only 0.81 per cent of the total reported area.

2.4.2 Cropping Intensity

Aligarh district's economy is primarily based on agriculture. There are three agricultural seasons in the district viz., *Rabi*, *Kharif* and *Zaid*. *Rabi* season starts in October or November and harvesting is done in March and April.

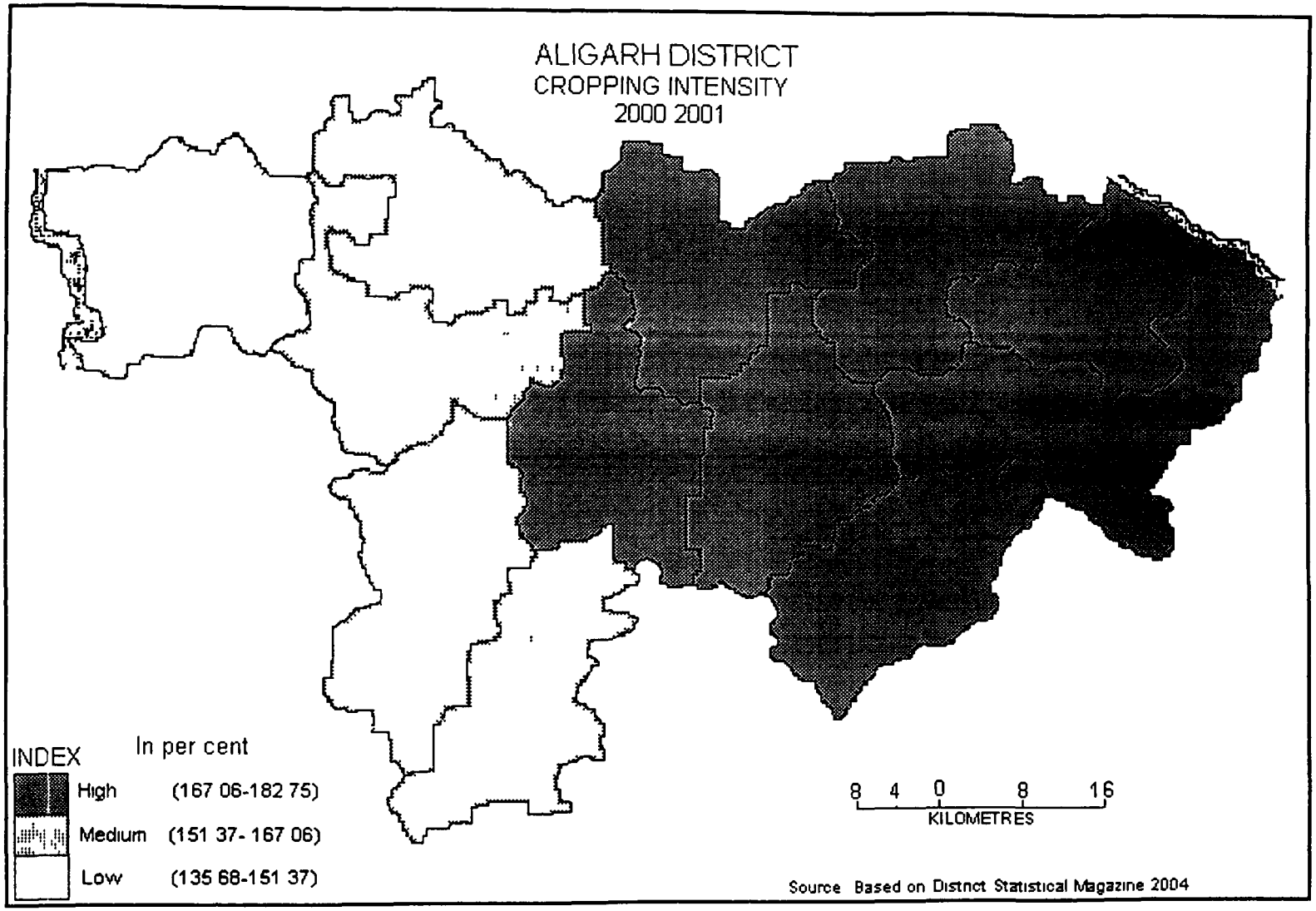

ALIGARH DISTRICT
CROPPING INTENSITY
2000 2001
INDEX
In per cent
High (167 06-182 75)
Medium (151 37- 167 06)
Low (135 68-151 37)
8 4 0 8 16
KILOMETRES
Source Based on Distnct Statistical Magazine 2004

Fig 2 11

The important *rabi* crops are wheat, barley, gram, peas, mustard, linseed, potato etc. *Kharif* season starts in July and the harvesting is done in October or November. The millets, maize, *arher,* rice and sugarcane etc. are the main crops of *Kharif* season. *Zaid* crops, which are of relatively little importance, occupy the fields from April to July. These crops are synchronized with the winter, rainy and summer seasons respectively. Cropping intensity which is measured in term of the number of times a land is put to agricultural use within a year, serves as a good index for assessing the agricultural prospects of an area. The average cropping intensity of twelve developmental blocks of Aligarh district was 168.93 per cent in 2000-2001.

Table 2.10 Cropping Intensity in Aligarh District, (2000-2001)

Blocks	Net sown area (hectare)	Total cropped area (hectare)	Cropping intensity (percentage)
Tappal	31888	43268	135.68
Chandaus	28017	45712	163.15
Khair	28924	48192	166.61
Jawan	23036	41816	181.52
Lodha	21912	37867	172.81
Dhanipur	23314	41479	177.91
Gonda	25022	40628	162.36
Iglas	22166	36463	164.49
Atrauli	24149	43270	179.17
Bijauli	17954	31091	173.17
Gangiri	29372	53679	182.75
Akrabad	21129	38064	180.15
District Total	296883	501529	168.93

Source: District Statistical Magazine 2004 p. 31.

Cropping intensity is not uniformly distributed within the district. As may be noted from (Table 2.10), Jawan, Dhanipur, Lodha, Atrauli, Bijauli, Gangiri and Akrabad blocks have higher value of cropping intensity than the average cropping intensity of the district which is 168.93 per cent. The lowest cropping intensity of 135.68 per cent was recorded for Tappal block (Fig 2.11).

2.4.3 Livestock

Livestock production considered as the source of income of the farmers has an important role in the rural economy of the district. According to the livestock census of 1997, the present district had a total number of 5,26,145

buffaloes, 127313 cattle, 1,31594 goats and 17079 sheep. The highest number of buffaloes are found in Chandaus (59610). Where as the highest numbers of cattle, goats and sheep are found in Bijauli (15,736), Gangiri (27,136) and Iglas (2,532) respectively (Table 2.11). The district has a well developed dairy industry.

Table 2.11 Block-wise Livestock in Aligarh District, (1997)

Block	Buffalo	Cattle	Goats	Sheep	Total
Tappal	76941	13214	4327	2406	96888
Chandaus	59610	10940	7617	1025	79192
Khair	24329	5290	5566	1276	36461
Jawan	42263	10758	10371	1193	64585
Lodha	45718	9003	9783	1393	65897
Dhanipur	37892	8986	13249	1807	61934
Gonda	48716	9333	7227	2122	67398
Iglas	47704	9627	7752	2532	67615
Atrauli	34468	10268	15590	707	61033
Bijauli	32042	15736	14134	421	62333
Gangiri	48810	12295	27136	935	89176
Akrabad	27652	11870	8842	1262	49626
District Total	526145	127313	131594	17079	802131

Source: District Statistical Magazine 2004

2.5 Industrial Economy

Aligarh district is especially known for the production of locks and scissors. There are numerous lock industries in the city. The district has made a sufficient headway in industrial development and has earned a name in metal works. There are 219 factories registered under Indian Factories Act of 1948, out of which ten are located in rural areas. Small scale industries registered with the Director of Industries, U.P. number 1050, out of which only 106 are located in rural areas. Satha Sugar Mill, Central Dairy Farm, Heinz Laboratories are running in the rural areas.

Aligarh is an important centre for building fitting materials, electrical equipments, brass hardware, glass, light engineering and other metal products. Aligarh is also known for the manufacture of handloom garments and cotton carpets, oil pottery, rope making, basket making, leather tanning and carpentary. Agro-based industries like oil mills, *dal* mills, Khandsari, vegetable, and fruit processing units are also operating in the district.

2.6 Transportation

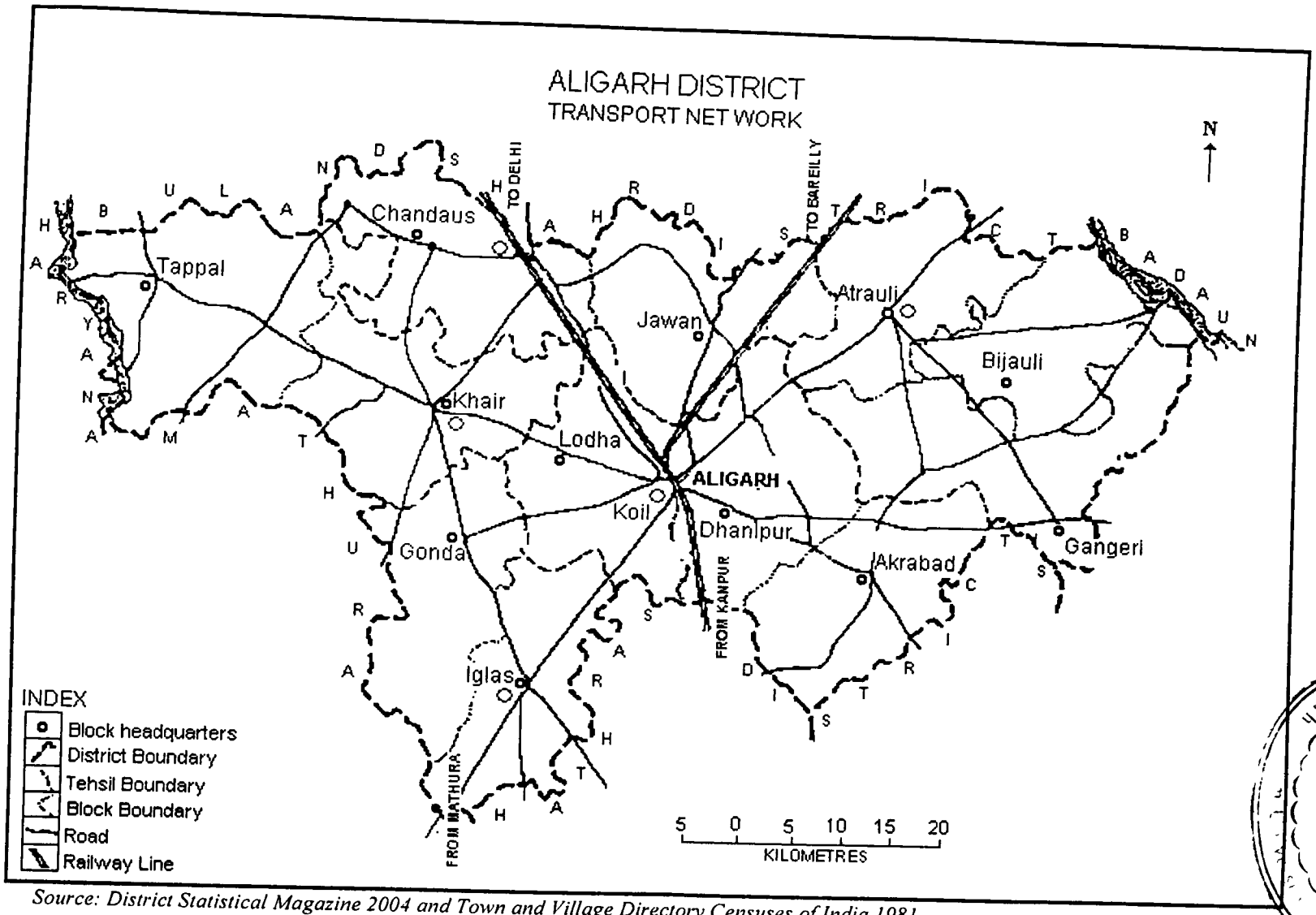
Transportation is of prime importance for agricultural and rural development. It plays an important role in creating contact between city or market and its tributary area and helps in the movement of goods and men efficiently. The transport linkages also influence the landuse pattern and associated agricultural development. The basic structure of transport system of the region consists of network of roads and railways. Aligarh district is well served by road and railways. The focal point of the district is Aligarh city from where communication arteries radiate to every corner of the district. The famous Grand Trunk Road passes through the district of Aligarh.

After shifting away of Hathras and Sikandra Rao *Tehsils* of Aligarh district in 1998, the total length of metalled roads in the district has been reduced from 2,427 km to 1,704 km. All the towns and large villages are, however, linked with the district headquarters through metalled roads. Dhanipur block has the highest density, while Lodha, Iglas, Atrauli and Bijauli have a moderately high density of roads. It is to be noted that block Tappal which lies in the extreme north western part and is bounded by river Yamuna on the west, and block Bijauli, which lies in the eastern part of the district, have the lowest density of the roads.

Railway occupies a place of cardinal importance among the modern means of transport. The first railway line in the district was constructed in March 1863 which was from Tundla to Aligarh and it was extended and completed in 1864. It has played an important role in the progress and prosperity of Aligarh district. Its importance cannot be under-estimated in the economy of an area.

2.7 Fairs and Rural Markets

Some fairs of commercial importance are held in Aligarh district. Though religious in origin, these fairs are commercial by adoption. The yearly fair known as Khereshwar fair is held at Hardaspur which is on the Khair road at a distance of about four kms from Aligarh city.



Source: District Statistical Magazine 2004 and Town and Village Directory Censuses of India 1981

Fig 2.12

Aligarh exhibition is the oldest and the greatest fair of the district. It is organized at a site on G.T. Road near the industrial estate. Aligarh exhibition is an industrial and agricultural fair because modern techniques, tools, seeds and manufacturing goods etc. are presented every year in this exhibition. All sort of cultural activities are organized in the exhibition for the entertainment of the people who participate in it. Besides it, small exhibitions are also held in Atrauli and Chharra.

Table 2.12 Block-wise Distribution of Rural Markets in Aligarh District (2004)

S No.	Blocks	Rural Markets
1.	Atrauli	7
2.	Gangiri	15
3.	Bijauli	14
4.	Iglas	4
5.	Gonda	6
6.	Jawan	7
7.	Dhanipur	8
8.	Lodha	8
9.	Khair	6
10.	Chandaus	4
11.	Lodha	7
12.	Khair	10

Source: District Statistical Magazine

Bi–annual cattle fairs are also held at Gabhana in the month of *Bhado* and *Jeth*. The site for the fair is located on the G.T. Road and near the railway line where a leveled open ground surrounded by dense trees, provides shelter during hot sunny days. The fair has a linear pattern along the roadside. In the fair, the sale and purchase of cattle are of considerable importance and it constitutes the main source of revenue for the village of Gabhana. Besides it, the cattle fairs are also held in Kwarsi, Nanau, and Kauriaganj. Important festivals organized in different parts of the district include Baldev, Chhat, Ram Lila, Phool Dool, Exhibition and Horse Show, Basant Panchmi, Rath Mela, Rath Yatra, and Kartika Purnima Mela etc. Table 2.12 shows block-wise distribution of rural markets. 96 rural markets are found here which are not evenly distributed in the Aligarh district. The highest numbers of rural markets are found in Gangiri block (15) and the lowest numbers of rural markets (4) are found in two blocks, namely, Iglas and Chandaus.

References

Burrad, S.S. (1915), Origin of the Gangetic Trough Commonly Called the Himalayan Fore–deep, Proceeding Royal Society London, Vol. 19–A, pp. 220–238.

Krishnan, M.S. (1956), Geology of India and Burma, Madras, p. 511.

Oldham, R.D. (1971), The Structures of Himalayas and the Gangetic Plains, Memoirs of Geological Survey of India, Vol. 42, No. 2, pp. 1–153.

Suess, E. (1904–24), The Face of the Earth, Oxford, Vol. 5.

CHAPTER-3

REGULATED MARKETS: AN OVERVIEW

3.1 Need for Regulated Market

The onset of technological revolution, better communications and introduction of money economy has increased the size of market and the marketing of agricultural produce. Marketing of agro-commodities has naw become a very complicated process beyond the comprehension of the producer[1]. Added to this, a number of steps, institutional, financial, technological, managerial etc., have been taken in India for increasing agricultural production and their marketing so as to bridge the gap between the demand and supply. Foodgrains, pulses, and commercial crops size of marketed surplus has increased due to increased production.

Primary assembling markets therefore grew up as staging areas at convenient points for assembling, distribution and exchange of goods moving from the village to the bigger cities where demand was concentrated. These primary and secondary markets constitute the first and most vital links in the long chain of agro-marketing. It is the primary market that the cultivator-seller first comes in contact with the trader. These traders, being the main functionaries, dominate in every activity in these markets and ignore the interests of the producers both as sellers and as buyers of consumer goods.

The producer on the other hand, is not getting adequate returns commensurate with the labour and investments due to intervention of middlemen and due to prevalence of many malpractices in marketing. Even he does not know the price that he is to receive for his produce. Neither he knows the prevailing prices. If he decides not to sell on that particular day, the producer has no facility to store his produce. This facility is provided only by the commission agent, who though supposed to look after the interests of the producer, actually colludes with the wholesaler and acts against the interests of the producer. The producer does not find even basic amenities of drinking water trough for his cattle in the market. Moreover, the cultivator being heavily dependent for his cash needs, on the commission agent is usually under

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[1] Saxena, B.S (1970), Role of Agricultural Marketing, Commerce Annual Number, pp. 121-123.

obligation to sell his produce through him. Under these circumstances, he finds difficult to sell his produce in the urban market.

In the villages, on the other hand, number of traders purchasing of agro-commodities from the cultivators is very much limited. Some of the small villages have only one trader who does not only buy all the produce available in village for the market, but also meets the credit needs of farmers as also the consumer goods and agricultural inputs required by the village population. Under these conditions, the trader not only buys produce at low price, but also charges a high price for inputs he supplied to the cultivators. As a result in most of the markets in the country, proportion of produce brought by the cultivators themselves is very little as compared to the total arrivals in the market.

Creating fair competitive conditions to increase the bargaining power of producer- sellers is considered to be the most important pre-requisite of orderly marketing. Most of the defects and malpractices, under, the marketing system of agricultural products have been more or less removed by the exercise of public control over markets through the establishment of regulated markets in the country.

Government action pertains to the formulation of rules and regulations necessarily to be followed by all the market functionaries and also evolving an institutional structure vested with authority to see that the market functionaries obey the directives. The enforcement of market regulation for agricultural produce through the Agricultural Produce Marketing Committees in various states has attempted to organize the agricultural marketing to a large extent.

A market regulated through governmental intervention strives to create mutual trust, confidence between traders and cultivators, establish fair trade policies and assures them reasonable returns.

'A regulated market is a market in which market functionaries are controlled by legislative measures designed to regulate the marketing of agricultural produce[1]'.

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[1] Saxena, H.M. (1992), Regulated Agricultural Markets: A Case Study of Rajasthan,. Rawat Publications, p.21

According to Mamoria and Joshi 'when the state or any public authority comes forward to enforce regulation for the organization of a market, it is termed as regulated market[1]'.

'Regulated Agricultural Markets have been established by the government to save the farmers from the exploitation by middlemen with regard to sale of his agricultural produce in an open market[2]'.

Regulated market is a government controlled exchange place of agricultural commodities in which efforts are made to ensure maximum benefit and fair price to the producer seller for their products. These markets play an important role in the development of food grains and vegetable cultivation. The regulated markets act not only as an exchange centres but also provide market infrastructures at site and diffuse the agricultural innovations in their market areas. They are not only a place of transaction of agricultural commodities but also provide an opportunity for people to meet and discuss matters of mutual interest, particularly social, economic and political conditions.

The regulated markets provide maximum facilities to both producer sellers and buyers by removing all kinds of problems like illegal deductions, wrong weighing and so on. Commission agents, weighmen, labourers etc., are also license holders and their all functions are controlled by market committee consisting of representatives of different market participants like producer, sellers, buyers, as well as administrators.

3.2 Important Features of Regulated Market

Under the provisions of Agricultural Produce Market Act, the state government gives notice of its intention to bring a particular area under regulation by notifying the market area, market yard, main assembling market and sub-market yard if any, under the principal regulated market. The meaning of these terms is explained under the following heads:

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1 Mamoria, C.B. and Joshi, R.L (1985), Principles and Practices of Marketing.

2 Dixit, R.S. (2001), Analysis of Spatial Distribution of Agricultural Markets, Geographical Review of India, Vol. 63, No. 2, pp. 141-152.

(a) Market Area

The area from which the produce naturally and abundantly flows to a commercial centre i.e.,the market, and which assures adequate business and income to the market committee.

(b) Principal Assembling Market

It is the main market which is declared as a principal market yard on the basis of transactions and income generated for the market committee.

(c) Sub-Market Yard

It is the sub-yard of the principal assembling market. This is a small market and does not generate sufficient income to be declared as a principal assembling market.

(d) Market Yard

This is a specified portion of the market area where the sale, purchase, storage and processing of agricultural commodities are carried out.

Market area is a spatial unit closely inter connected with a market, therefore forming a geographical unit. Market area is a geographical concept because it denotes a region which is served by a particular market. Market area of a regulated market is an area from where producer/farmers, traders bring their products for sale.

A regulated market can not sustain in isolation and its origin, growth and development depends on the surplus production from its surrounding region. Market area of a regulated market is a result of lots of factors such as:

1. Productivity of the region
2. Nature of accessibility
3. Size of the market
4. Location of other regulated markets
5. Administrative boundaries
6. Range of goods
7. Consumer behaviour etc.

Sometimes physical factors like terrain, forest, rivers, etc., also have had an impact on boundary of market area. But basically, market areas are the result of economic and demographic factors.

Marketing geographers are interested in delimitation of trade area boundaries to understand present status of the market and for its future planning (Saxena. H.M. 2004)[1]

In the present context i.e., market area of the regulated markets, the problem of delimitation of market area is not applicable here because each regulated market has a declared market area under section of the 'Uttar Pradesh Rajya Krishi Utpadan Mandi Adhiniyam Act, 1964.

The state government may at any time by notification in the official gazette, exclude from a market area any area or include in any market area any other area. For each market area there shall be one principal market yard and one or more sub-market yards, as may be necessary. Therefore, it becomes clear that all regulated markets in the state have their specified area.

Table 3.1 Numbers of Villages around Regulated Market of Aligarh District (2005)

Regulated Markets	Number of Villages
Dhanipur	274
Khair	261
Chharra	143
Atrauli	130

Source: Records from the Respective Markets of Aligarh District-2005

Data from different markets indicate that Dhanipur regulated market is having maximum 274 villages as notified area followed by Khair with 261 villages, Chharra with 143 villages and Atrauli consisting of 130 villages in their notified area respectively (Table 3.1).

The study also indicates that most of the villages located in marginal areas between two markets have a choice to go to the market of their liking. There is no agency to check this practice. Apart from this, inter-district and even inter-state movement of commodities is also in practice (Saxena.1992).

In Aligarh district there are four assembling regulated markets; Dhanipur, Khair, Atrauli and Chharra, and six sub-market yards. Dhanipur is

[1] Saxena, H.M. (2004), Marketing Geography, Rawat Publications, Jaipur.

the biggest regulated assembling market and having only one sub-market i.e., Herduaganj. Khair regulated market has three sub- market yards i.e., Jattari, Gabhana and Naujhil. And under Chharra principal assembling market has two sub-market yards Gangeri and Koriagunj, whereas no sub-market is working under Atrauli regulated market (Table 3.2).

Table 3.2 Principal Assembling Markets and their Sub Market Yards (2005)

Regulated Markets	Name of Sub-Markets
Dhanipur	Herduaganj
Khair	Jattari, Gabhana, Naujhil
Chharra	Gangeri, Koriagunj
Atrauli	-

Source: Records from the Respective Markets of Aligarh District-2005

For an effective regulation and centralization of sales, the establishment of spacious and well laid out market yards is necessary. In fact, it is impossible for the market committees to exercise supervision over multifarious transactions involved in marketing process, unless the sales are affected at centralized place.[1]

Therefore, for this purpose market committees must give top priority to acquire land for the construction of market yards at suitable locations and to develop them with necessary amenities at the earliest possible time.

According to H.M. Saxena "market yard or agricultural mandi is a place where all marketing activities are performed such as assembling, sale and purchase, grading, storage, banking etc. This is also a place where all marketing agencies like producer- sellers, commission agents, traders, bankers, insurance people, administrative agencies etc. either have their permanent base or they use this place temporarily like farmers[2]. Market yard is a nerve centre for the performance of the activities of a regulated market. The proper location and layout of a market yard is the degree of success of a committee. During the planning of location and layout of a market yard, it is necessary to provide

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1 Government of India (1971), Directorate of Marketing and Inspection, Working on Regulated Markets in India, Regulated Markets, Vol. II, p-38, Nagpur.

2 *Op. cit* (1992), p. 65.

communication facilities, proper structures, buildings and other amenities so as to ensure orderly and efficient movement of goods.

3.3 Objectives of the Regulated Market

The main objective of the regulation of agricultural produce markets is to protect the interest of producers in the markets. Prior to this, producer sellers were severely exploited by the monopoly of traders in unregulated markets. Maximum efforts are made to fulfil the following objectives.

(a) To prevent the exploitation of farmers by the traders in marketing of their products.

(b) To make the marketing system more effective and efficient with a view to provide better prices of products to the producer sellers and to make available to the consumers at reasonable price.

(c) To encourage the farmers for better production both quantitatively and qualitatively by ensuring remunerative price incentives to the producers.

(d) To make an orderly marketing system of agricultural produce through the development of infrastructural facilities like link roads to villages from the regulated markets, storage, credit facilities, input facilities etc., in the market complex.

3.4 Significance of Regulated Market

Regulated market is a place where producer sellers, traders, middlemen market administrators and workers assemble for the marketing of agricultural products in order to fulfil the demands of society. These markets not only function as exchange centres but also provide market infrastructures at site and diffuse the agricultural innovations in their market areas. They are not only a place of transaction of agricultural commodities but they provide an opportunity for people to meet and discuss matters of mutual interest, particularly social, economic and political conditions as well.

The marketing system as well as social structure is always in a state of change both in terms of space and time. Whatever change has occurred in the

social structure is the result of multiple factors. Among them, marketing is also one of the most important factors because it provides an opportunity of interaction between rural population and urban environment. The relationship between producer farmers and traders has undergone a great change. Similarly, a change has also come in the farmers' way of life, his system of agriculture and social relationship etc.

Regulated markets have created a feeling of confidence of receiving fair deal, in the minds of the cultivators. This provides the urge in which they are well ready to accept new ideas and to strive to increase their agricultural production.

Regulated markets would benefit the producers economically, socially and psychologically. Economically, the producer gains by way of reduction of unwarranted market charges and unauthorized deductions. Socially, it profits the producer as he is now directly involved in the management of market committee and it provided him with a platform where he can vent out to his grievances and discuss matters concerning his interest. Psychologically, the producer occupies a dominant position in the market committee and faces the traders with greater confidence.

Thus, establishment of regulated markets is generally and widely accepted as a panacea of eliminating the ills in the traditional marketing system. Market regulation creates healthy conditions in the market, provides various amenities to the functionaries and ultimately helps in realizing a better reward to the producer-sellers.

3.5 Historical Background of Regulated Markets

The history of establishment of regulated markets is traced back to 1886, when the elements of regulation were introduced in the Karanja Cotton Market under the Hyderabad Residency's order. Though the motive behind this regulatory measure by the then British rulers was to ensure supply of pure cotton at reasonable prices to the textile mills at Manchester (U.K.). Subsequently, in the year 1897, the Berar Cotton and Grain Market law was

enacted. This law was constituted by the orders of the Governor General in Council on 6th May, 1897. It was the first statute on regulation of marketing of agricultural produce. The subsequent acts, whenever passed were virtually based on the general principles embodied in this law. The salient features of this law were:

(i) All the markets as existed on the date of the enforcement of the law came under its fold.

(ii) The resident could declare any additional market or bazaar for the sale of agricultural produce.

(iii) The Commissioner was to appoint from amongst the list of eligible persons submitted by the Deputy Commissioner, a committee ordinarily of five members two representing the Municipal Authority concerned and remaining three from amongst the cotton traders for enforcing the law.

(iv) The committee was authorized to appoint a sub–committee or joint committee from amongst its members for the conduct of any work and/or delegate its duties to one or more members.

(v) Trade allowances or customs in usage were abolished.

(vi) Unauthorized markets and bazaars were banned within five miles of the notified market or bazaar.

(vii) The resident was empowered to make rules for some specific matter.

(viii) Market functionaries were required to take out licenses.

(ix) Penalties for breach of certain provisions of the law were laid down.

The main drawback in this law was that it provided no representation for the growers in the committee. In fact it was the grower, who needed the maximum legislative protection.

The Indian Central Cotton Committee was appointed by the Governor General in Council in 1917 to look into the problems of marketing of cotton. This committee had observed that in most of the cases the cotton growers were selling cotton to the village trader–cum–money lender, under whose financial obligation they came and their price was much below the ruling market rate. Other agriculturists were seriously handicapped in securing adequate price for their produce because of a long chain of middlemen in the marketing process.

The committee recommended that on Berar system markets for cotton should be established in other provinces having compact cotton tracts. This could be done by introduction of suitable provisions in the Municipal Acts or under a special regulation as in the case of Berar Act. The Government of Bombay presidency was the first to implement this recommendation by enacting the Bombay cotton Markets Act in 1927. This act was an improvement over the Berar cotton and Grain Markets Law of 1897 as it provided for representation to the growers on the market committee and also contained provisions for spending the surplus funds of the market committee, which should be transferred to the respective local bodies in whose jurisdiction the market used to be situated. The rules under this act were framed in 1929 and the first regulated market was established under this act at Dhulia during the year 1930–31.

The Royal Commission on Agriculture (1928) recommended the establishment of regulated markets on the Berar pattern as modified by the Bombay Cotton Markets Act 1927, with special emphasis on the application of the scheme of regulation to all agricultural commodities instead of cotton alone; provision for establishment of machinery in the form of a board of arbitration for the settlement of disputes; prevention of brokers from acting for both buyers and sellers in the markets; adequate storage facilities in the market yards; standardization of weights and measures and the establishment of market committees only under a single pervading provincial legislation. The commission also recommended that the Provincial Governments should take initiative in the establishment of regulated markets and grant loans to market committees for meeting initial expenditure on land and buildings. This recommendation had a salutary effect on the states as borne out from the fact that a number of states enacted regulated markets act thereafter. In the year 1930, the 'Hyderabad Agricultural Markets Act' largely modeled on the 'Bombay Cotton Markets' Act 1927, was passed. The Central Provinces (now Madhya Pradesh) came next with the 'Central Provinces Cotton Market' Act, 1932. In 1935, another law called 'Central Provinces Agricultural produce

Markets Act' was passed on lines of the Central Provinces Cotton Markets Act, 1932. According to this act, markets could be regulated for the sale and purchase of all kinds of agricultural produce other than cotton as the latter was already covered by the 'Cotton Markets' Act of 1932.

Market regulation was introduced in Madras (now Tamil Nadu) under the 'Madras Commercial Crops Markets' Act, 1933 and the first regulated market was established in this state in 1936 at Tripura in Coimbatore district.

In 1938, Model Bill was prepared by the Central Agricultural Marketing Department (DMI) on the lines of which several states drafted their own bills.

In 1939, the Government of Bombay enacted the Bombay Agricultural Produce Markets' Act and made it applicable to all the agricultural commodities including cotton. As a result, the cotton market Act of 1927 was repeated and all the market committees set up under this act were declared deemed to be the market committees under the new Act.

In Mysore State (now Karnataka), the 'Mysore Agricultural Produce Markets' Act was passed in 1939. However, the first regulated market at Tiptur could be established only about a decade later i.e. in November, 1948.

The out break of the Second World War in September, 1939 dislocated the normal economic activities in the country. Controls on foodgrains and other essential commodities were imposed, and their free movement was restricted. The levy system for direct procurement of foodgrains from producers was resorted and price control and statutory/informal rationing was introduced. As a result, very limited progress could be achieved in the field of regulation during the war period.

Market regulation was introduced in the erstwhile Patiala state in January, 1948 under the 'Patiala Agricultural Produce Markets' Act, 1947. The Government of Madhya Bharat passed the 'Madhya Bharat Agricultural Produce Markets' Act in 1952. This was modeled mostly on the line of Bombay Act. All *mandis* which were governed by the previous laws of the respective states were declared as regulated markets under the new Act.

The government of Sourashtra enacted the Sourashtra Agricultural Produce Markets' Act, in February, 1955. This Act was also framed on the lines of the Bombay Act.

3.6 Progress and Distribution of Regulated Market

The progress of market regulation was not substantial till the Second World War. After independence, the planning commission laid emphasis on a market regulation scheme. Up to March 2005. 7,557 markets were brought under regulation. The progress of market regulation in India during different periods is given in table 3.3.

Table 3.3: Progress of Market Regulation in India

Period	Number of Regulated markets	Regulated markets as per cent of total wholesale assembling markets (28090)
Before Commencement of First Five Year Plan (April 1951)	236	0.84
At the End of First Five Year Plan (March 1956)	470	1.67
At the End of Second Five Year Plan (March 1961)	715	2.54
At the End of Third Five Year Plan (March 1966)	1,012	3.60
At the End of October (1973)	2,754	9.80
At the End of March (1976)	3,528	12.55
At the End of September (1977)	3,763	13.39
At the End of March (1979)	4,345	15.46
At the End of March (1980)	4,446	15.82
At the End of March (1981)	4,605	16.39
At the End of March (1982)	4,792	17.05
At the End of March (1984)	5,579	19.86
At the end of March (2005)	7557	29.90

Source: Directorate of Marketing and Inspection, Faridabad, (2005)

The state-wise progress of market regulation is given in the Table 3.4. Andhra Pradesh, Bihar, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Rajasthan, Punjab, Uttar Pradesh, Maharashtra, each introduced a scheme for the regulation of all assembling wholesale markets. The progress in Goa, Meghalaya, Sikkim, Pondicherry, Chandigarh, Tripura, and Manipur is extremely poor. Among the union territories, the progress of market regulation in Delhi and Pondicherry is good. Market regulation acts have not been

implemented or passed in Jammu & Kashmir, Kerala, Manipur, Andaman & Nicobar, Dadar and Nagar Haveli, and Lakshdweep

Table 3.4: Distribution of Regulated Markets in India

S. No.	State/Union Territories	Total number of Wholesale Assembling Markets as on 31-3-2005	No. of Regulated Markets as on 31.3.2005		
			Principal Markets	Sub Markets	Total
1	Andhra Pradesh	589	299	590	889
2	Arunachal Pradesh	30	Reported Nill		
3	Assam	822	20	204	224
4	Bihar	1794	95	415	510
5	Jharkhand	118	27	276	303
6	Goa	19	1	7	8
7	Gujarat	338	190	215	405
8	Haryana	441	106	178	284
9	Himachal Pradesh	68	10	28	38
10	Jammu and Kashmir	73	APMR Act not Yet Implemented		
11	Karnataka	1433	145	347	492
12	Kerala	2351	APMR Act Not Yet Passed		
13	Madhya Pradesh	1806	233	255	488
14	Chattisgarh	1679	73	106	179
15	Maharashtra	4373	287	584	871
16	Manipur	69	APMR Act Not Yet Passed		
17	Meghalaya	194	2	-	2
18	Mizoram	41	5	28	33
19	Nagaland	88	Reported	Nil	
20	Orissa	1548	45	269	314
21	Punjab	437	145	292	437
22	Rajasthan	971	123	293	416
23	Sikkim	37	1	-	1
24	Tamil Nadu	977	274	14	288
25	Tripura	638	21	-	21
26	Uttar Pradesh	3906	244	340	584
27	Uttranchal	57	25	32	57
28	West Bengal	3139	43	641	684
29	Andaman & Nicobar	-	APMR Act Not Yet Passed		
30	Chandigarh	1	1	-	1
31	Daman & Diu	-	Reported	Nil	
32	Dadar and Nagar Haveli	-	APMR Act Not Yet Passed		
33	Delhi	37	9	12	21
34	Lakshdeep	-	APMR Act Not Yet Passed		
35	Pondicherry	16	4	3	7
	Total	28090	2428	5129	7557

Source: Directorate of Marketing and Inspection, Ministry of Agricultural and Rural Development, Govt. of India, Faridabad, 2005

3.7 Administrative Organization

A sound and effective administration is essential for the successful operation of any organization. Newman defines 'administration' as "the guidance, leadership and control of the efforts of a group of individuals towards some common goal[1]." Undoubtedly, a good administration is one which enables the group to achieve its objectives with minimum expenditure, resources and efforts, and least interference with other worth while activities. It is however felt necessary to study the administrative machinery at the state level since the administrative body at the level of an individual market cannot function independently.

The administrative patterns of regulated markets in different states are largely influenced by the respective market legislations. These legislations intend to regulate the sale and purchase of agricultural produce at the primary level of marketing. Having regard to the fact that every transaction involves a buyer and a seller whose interests are diagonally opposite, these acts protect the interests not only of the producer sellers but also of buyers by imposing some restrictions on the manipulative activities of various market functionaries. Though these acts contain various penal clauses, regulation of markets is to be understood as a developmental measure rather than a police action.

The administration of Agricultural Produce Market Acts in different states is carried out by different authorities. The Director of Agriculture is, in charge of administration of the Markets Acts in Bihar, Rajasthan, Madhya Pradesh, Tamil Nadu, Uttar Pradesh, Tripura and Himachal Pradesh.

The state government is empowered to declare a market area (except under the Gujarat Act, where this power is vested in the Director) to notify commodities as agricultural produce, to establish market committees under the Act, to permit market committees to raise loans (except under the Maharashtra Act, where the Director is empowered), to supersede market committees, to make rules etc. In all the states, except in Karnataka, the state governments are

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[1] Newman, W.H. (1950), Administrative Action, Prentice-Hall Inc., Englewood Cliffs, N.J., New York, p-4.

also vested with the power to remove any member or members of the market committee from holding their office.

3.8 Organization and Composition of Market Committee

A market committee established under the markets Act is entrusted with the responsibility of enforcing within the notified area, the different provisions of the Act, the rules, and the by-laws framed there under. Furthermore, the act enjoins upon a market committee to establish markets within its market area and provide the necessary facilities to persons using it for an orderly marketing of agricultural produce and as directed by the Government from time to time. Such facilities may include competitive conditions for the sale and purchase of agricultural commodities, storage facilities, arrangements for weighment and prompt payment, provision of amenities in the market- yard such as drinking water, rest houses, cattle sheds, cart-parks, roads, covered pucca platforms, lighting and sanitary arrangements etc. A market committee is therefore, the pivot of the whole mechanism designed to improve the standards of marketing within its jurisdiction.

Market committees are corporate bodies comprising members representing various interests involved in the sale and purchase of agricultural produce. There is a great heterogeneity in the composition and constitution of market committees as provided in the various Acts.

3.8.1 Constitution of Market Committee

The seminar on regulated markets organized by the Ministry of Food and Agriculture, in January 1959, was of the view that (i) the strength of the committee be such as to accommodate various interests in proper proportions. The committee should neither be too small nor too unwieldy; (ii) the committee should consist of 12 to 18 members depending on the size of the market and other considerations; (iii) the interests of the grower should predominate with at least 50 per cent seats going to them, (iv) the traders representation should not exceed 25 per cent and (v) the cooperative marketing societies, the municipal or local bodies and government nominees should have the remaining seat and if there is a warehousing corporation one seat should go to it.

In connection with election of growers' representatives, it favoured the adoption of the system of indirect election through the grower- members of the *panchayats* other registered growers associations and the agricultural cooperatives.

Under the Uttar Pradesh Act (the Uttar Pradesh Krishi Utpadan Mandi Adhiniyam, 1964), the market committees consist of 19 members or more in cases where more than one local body is exercising jurisdiction over the principal market- yard or a part thereof.

3.8.2 Functions of the Market Committee

The main functions of the market committees are:

(a) To ensure fair dealing between the producers/sellers and purchasers/ traders and efficient marketing of the produce.

(b) To ensure prompt and ready payment to the sellers.

(c) To manage for grading, standardization and auction of the produce.

(d) To check the weights and measures used by the traders.

(e) To provide better facilities in the yard and also to accelerate rural development programmes in the area.

(f) To collect and provide upto date and reliable market information to the participants, and

(g) To act as mediator in case of disputes between the parties.

3.8.3 Constitution of Market Committee in Aligarh District

In Dhanipur regulated market, market committee named as "Rajya Krishi Utpadan Mandi Parishad Lucknow" consists of 45 members. Supersede system prevails over there. City Magistrate is considered as the president and rest of the employees work under his supervision. Khair regulated market of Aligarh district consists of 23 members. Supersede system is prevaile here also and SDM is the president of this committee. Chharra regulated market of Aligarh consists of 11 members, out of which 6 are farmer representatives, 2 traders, one each from among Senior Marketing Inspector, Mandi Sachiv and its president (SDM). Atrauli regulated market of the district consists of 7

members, out of which 4 are traders, one from senior marketing inspector, Mandi Sachiv and its president (SDM). Supersede system is also prevailing here.

3.9 Infrastructural Facilities

A regulated market yard is a place where marketing of agricultural produce is carried out and also where agencies relating to agricultural marketing are located. So from the structural point of view an agricultural market yard is different from other market places. Every market is supposed to have a standard lay-out in which all the market infrastructures are located. One of the main objectives of regulated marketing is to construct a planned market yard, where all the facilities of market are available. The need for planned and orderly regulated markets has been felt because of difficulties experienced in the previous regulated market places. The following are the common difficulties or conditions which were existing in traditional or unplanned regulated markets.

(i) The market place (generally known as *dhanmandi*) were congested and often located along narrow lanes which do not permit easy access to vehicular traffic. It becomes very difficult for traders to handle their produce and for market committees to supervise transactions.

(ii) The shops were scattered all over the town and the transaction took place all over the locality.

(iii) Adequate space was not available for exhibiting the produce, its cleaning and grading etc.

(iv) There were no auction platforms. The producer used to sell his produce on the day of its arrival in the market at whatever price.

(v) There was neither place for parking of carts nor for cattle.

(vi) No facilities of drinking water, public toilets, veterinary dispensary, canteen, rest house etc., were available.

(vii) Similarly, banks and post offices were located away from the markets.

These difficulties are still there in most of the regulated markets where yards have not been constructed. But at present the regulated market yards are providing lots of infrastructural facilities. The regulated market yards besides providing facilities for storage and sale of agricultural produce etc, also provides facilities for sale of agricultural inputs, banking and insurance. It also has consumer stores where farmers can buy their requirements, post office, veterinary dispensary etc. The details of regulated market yard infrastructure are as follows:-

(a)Shop-cum-godowns (b) Godowns (c) Retail shops, (d) Market committee office (e) Grading labouratory (f) Boundary wall, (g) Veterinary dispensary (h) Sale platforms, (i) Farmers guesthouse (j) Water troughs (k) Water huts (l) Canteen (m) Public urinals, latrines and bathrooms (n) Dust bin (o) Cycle stand (p) Bank (q) Post office (r) Internal roads (s) Drainage (t) Water supply arrangements (u) Electricity and lighting arrangements (v) Space for fodder shops, petrol pump, automobile workshop, godowns of FCI, CCI, CWC, etc.

The above mentioned structures/facilities may differ from one market to another in size according to the status of the market. With the growth of a market, the size and number of structures also increases. In fact, the infrastructure must be according to the needs, i.e., volume of trade in that particular market. The classification of markets in A, B and C category is only for convenience and often the status of a market changes. Therefore, for the construction of a market yard, proper perspective is needed so that it will be useful for a long time. In recent years, a new class of market- super 'A' class- has also been identified, which is a top class market having much more facilities and infrastructure.

3.10 Notified Commodities

Market legislation in India covers all agricultural as well as horticultural produce, livestock, their products and forest products. But, since the regulation of market is a state subject, there are some variations in the state legislations. In the case of Mysore Agricultural Produce Marketing (Regulation) Act, 1965.

The Madras Agricultural Produce Markets Act, 1951, and Uttar Pradesh Act, 1964, since no schedules have been appended to these Acts, a separate notification has always to be issued in respect of every commodity to be notified for regulation under the acts.

Most of the regulated markets now functioning are, by and large, multi-commodity markets. There are, however, some markets which deal in a single commodity like tobacco, vegetables or livestock[1].

3.10.1 Commodities under Market Regulation

The Uttar Pradesh Mandi Adhiniyam 1964 has specified the commodities for marketing in regulated markets of the state. The following commodities have been listed after amendment.

1. **Cereals:** Paddy, Rice, Jwar, Bajra, Maize, Barley, Wheat, Bejhar
2. **Legumes:** Urd, Moong, Gram, Pea, Arhar, Masur, Lobia, Soyabean, Dnchsd, Guar, Snseeds .
3. **Oil seeds:** Groundnut, Til, Mustard, Castor, Linseed, Sehwan, Mahua, Gullu, Coconut, Sunflower.
4. **Fibres:** Cotton, Jute, Sani, Patson, Dancha, Mesta.
5. **Narcotics:** Tobacco
6. **Spices:** Coriander, Rapechillies, Methi, Turmeric, Amchur.
7. **Miscellaneous:** Gur, Khandsari, Popsyd, Rab, Sakkar, Jagery, Makhana
8. **Vegetables:** Potato, Onion, Garlic, Closia, Ginger, Chillies, Tomato, Cabbage, Cauli-flower, Carrot, Radish, Brinjal, Tinda, Battleguard, Greenpea, Parwal, Jackfruit, Cucumber, Whiteguard, Ladyfinger, Pumpkin, Beterguard, Sweetpotato.
9. **Fruits:** Lemon, Orange, Mosmbi, Malta, Grapefruit, Banana, Pomgranete, Muskmelon, Watermelon, Papaya, Apple, Guava, Ber, Aonla, Litchi, Chicu, Peches, Loquat, Mango, Jackfruit, Apricot, Pear, Grapes, Pumelo.

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[1] Directorate of Marketing and Inspection (1968), Working of Regulated Markets in India-Regulated Markets, Vol.II, p.19

10. Forest Produce: Gum, Wood, Ctechu, Lac

11. Animal Husbandry: Ghee

12. Fish

3.11 Site of the Regulated Market

Site of the market yard is another important aspect, which requires special consideration by geographers i.e., its actual location- whether located in the congested part of the town, along main road, at the periphery of the town or away from the town. Before regulation all the markets of Aligarh district was located at the heart of the city or along the main road of the town, at the periphery of the town or away from the town.

There was heavy rush of vehicles both of town dwellers as well as of farmers who brought their products mostly in bullock and camel carts. There was no facility of auctioning and other processes of marketing. Soon this fact was realized and the construction of new market yards was taken up. Now four regulated markets have well designed market yards in Aligarh district.

Study shows that all the new regulated markets have been shifted to outside of towns, or along the main road. The main consideration for the location of regulated market is the availability of land. On an average 20 hectares land will be needed for 'A' class market yard, 13 hectares for 'B' class and 7 hectares for 'C' class. Sometimes it is happened that other factors are neglected but land availability remains to be the prime consideration for the location of regulated market.

In Aligarh district Dhanipur is comes under 'A' grade and Khair and Chharra comes under 'B' grade while Atrauli is only comes under 'C' grade regulated market.

References

Directorate of Marketing and Inspection (1968), Working of Regulated Markets in India- Regulated Markets, Vol.II, p.19

Dixit, R.S. (2001), Geographical Review of India, Vol. 63, No. 2, pp. 141-152.

Government of India (1971), Directorate of Marketing and Inspection, Working on Regulated Markets in India, Regulated Markets, Vol. II, p-38.

Mamoria, C.B. and Joshi, R.L (1985), Principles and Practices of Marketing.

Newman, W.H. (1950), Administrative Action, Prentice-Hall Inc., Englewood Cliffs, N.J., New York, p-4.

Saxena, B.S (1970), Role of Agricultural Marketing, Commerce Annual Number, pp. 121-123.

Saxena, H.M. (1992), Regulated Agricultural Markets: A Case Study of Rajasthan,, Rawat Publications, p.21.

Saxena, H.M. (2004), Marketing Geography, Rawat Publications, Jaipur.

CHAPTER-4

STURCTURE AND FUNCTIONS OF REGULATED MARKETS IN ALIGARH DISTRICT

4.1 Structure and Functions of Regulated Market

The development of agrarian economy depends directly on the growth of its marketing sector. But the growth in this sector has not yet attained the levels anticipated by the government. A major reason for this disappointing position is that not enough attention has been devoted to the facilities and services, which must be available to farmers if agriculture is to develop. Whatever the development that took place in the sphere of marketing was due to the gradual progress made towards the commercialization of agriculture, as a result of its own dynamics. Though the market regulation of agricultural produce in the state has been in the existence for nearly four decades but the real progress in the development of agricultural marketing was witnessed since mid eighties. Under the guidance and support of the Directorate of Marketing and Inspection at central level, different state governments have passed Agricultural Produce Market Acts, providing for regulation of agricultural markets.

A regulated market is essentially a service organization with an objective of ensuring orderly marketing of agricultural commodities. It performs certain functions in order to realize this objective. These functions include providing a location of well planned market yard with certain basic amenities and facilities, licensing and control of market functionaries, rationalization of market charges and allowances, dissemination of market information, organization and supervision of sales and payment of sale proceeds and settlement of disputes-all to be performed with sound financial base. This is also a place where all marketing agencies like producer sellers, commission agents, traders, bankers, insurance people, administrative agents etc. either have their permanent base or they use this place temporarily like farmers. Thus, a market yard is the most prominent place where transactions of agricultural commodities are performed. Since it is a spatial unit, geographers are interested in their study. The present chapter is an attempt in this direction to understand the location and the structural pattern of agricultural market yard.

Assessment of various agencies in marketing of agro-commodities, market functionaries, methods of transaction have been discussed. Moreover, channels of agro-commodities have also been discussed in this chapter.

4.2 Location of Regulated Markets in Aligarh District

The location of regulated markets seems to be associated with the distribution pattern of settlements in general, and with the density of population and productivity of land in particular. For sustaining a regular function of market, certain minimum threshold population is required, which may be distributed in the service area of the market place. Hodder (1965) mentions that there seems to be a critical density of about 50 persons to the square mile, above which there is a regular pattern of periodic markets and below which there are very low few indeed[1]. Similarly, productivity per worker plays crucial role in the evolution of market centers. Production should be higher than mere subsistence level. This need of increasing surplus production leads to the specialization of production of crops.[2]

There are four regulated principal markets and six sub-markets located in different parts of Aligarh district. The first regulated market was established in 6 March 1982 in Khair, which serves an area of 25-30 kilometres. After four years, in 1986, another market had been established in Dhanipur. Subsequently in 1992 Atrauli and Chharra regulated markets ware established. Three out of four regulated markets are located in eastern (Atrauli), southeastern (Chharra) and central part (Dhanipur) of study area, whereas Khair is situated in western part of the district (Fig 4.1).

Before the construction of these regulated market centrs, all old market centres were located in the congested part of the cities, which generate lots of problems like shortage of parking space for the vehicles, auction platforms, storage facilities etc.

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1 Hodder, B.W (1965), Distribution of Markets in Yarubaland, Scott, Geog. Mag. Vol.81, pp.48-58.

2 Sharma, S.K and Singh, D (2003), Spatio-Temporal Trend of Marketing of Agricultural Produce in Madhya Pradesh, The Geographer, Vol-50, No.1, pp.85-106.

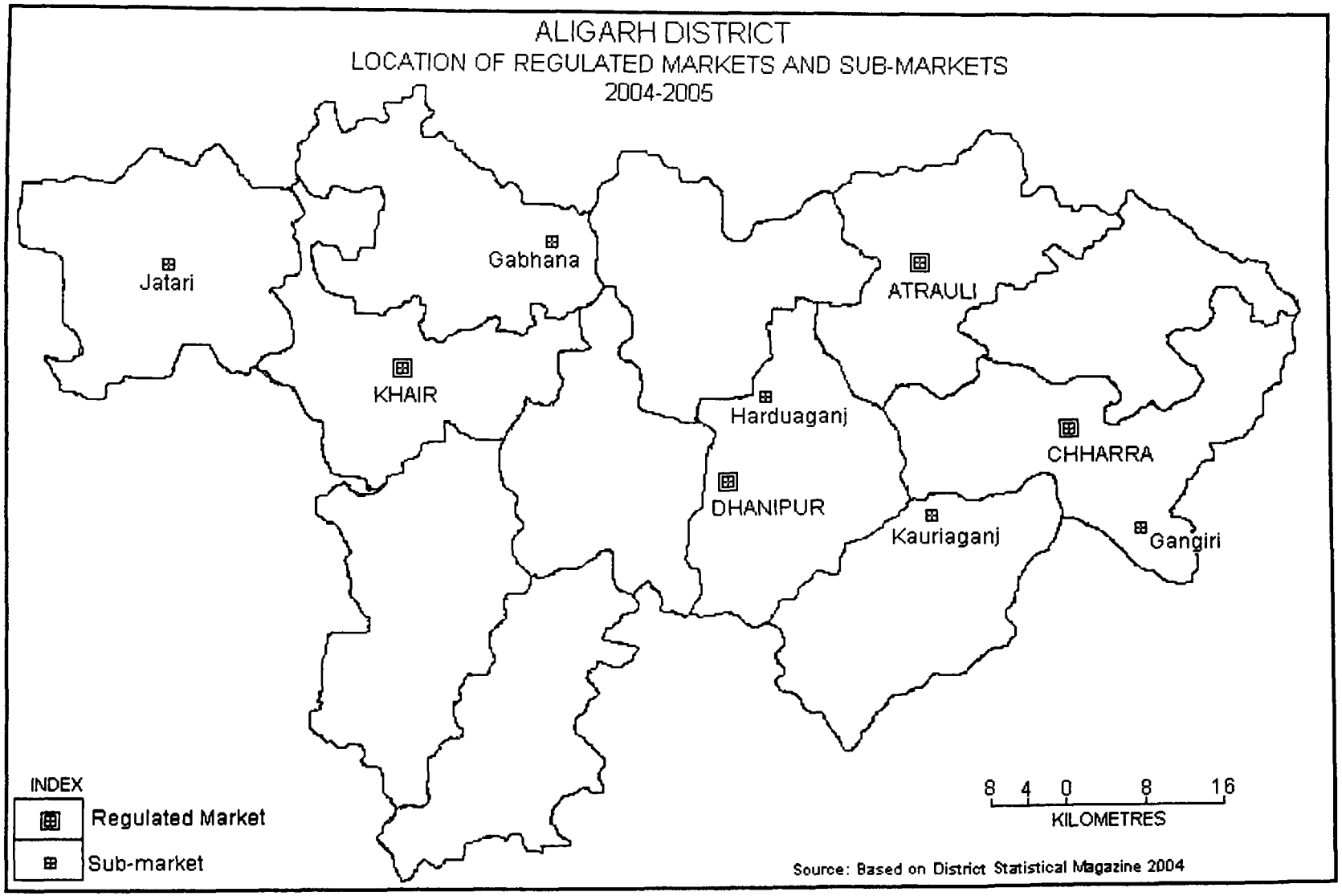
ALIGARH DISTRICT
LOCATION OF REGULATED MARKETS AND SUB-MARKETS
2004-2005
Jatari
Gabhana
ATRAULI
KHAIR
Harduaganj
CHHARRA
DHANIPUR
Kauriaganj
Gangiri
INDEX
Regulated Market
Sub-market
8 4 0 8 16
KILOMETRES
Source: Based on District Statistical Magazine 2004

Fig 4.1

Taking into consideration of all these problems market committees have decided to change the location of regulated markets to facilitate the market participants.

Empirical evidences support the views that in northwestern part extensive area is cultivable with good capability of crop production responsible for the establishment of Khair regulated market. Although eastern and southeastern parts are no doubt very productive but the size of land holding of this area is comparatively low compare to the northwestern part of district, which ultimately reduced the arrival of agricultural commodities in the regulated markets.

4.3 Infrastructural Facilities in the Regulated Markets

In Aligarh district four regulated markets are located in different parts of the district, in which Dhanipur is the biggest regulated market. Each regulated market provides many infrastructural facilities to the market users. The structure and facilities may differ from one market to another in size according to the status of the market and degree of transaction.

Morphological Pattern and Functional Structure

Figure numbers 4.2, 4.3, 4.4 and 4.5 shows that Dhanipur market yard is roughly rectangular in shape with little projection in eastern side, while Khair, Chharra and Atrauli market yards are rectangular in shape. The morphology of the market can be explained by categorizing the premises of the market yard into three parts, i.e., trading, ancillary and infrastructural ones.

4.3.1 Trading Premises

(a) Auction Platform

Seven auction platforms are located in Dhanipur regulated market in which four auction platforms are used for food grains and three auction platforms for vegetables. In Khair, Chharra and Atrauli the number of auction platforms are 5, 5 and 2 for unloading of farmers produce and for auctioning.

(b) Shop-cum-godowns

Shop-cum-godowns have been provided to licensed traders only to conduct business in the market yard with sufficient space for drying and

cleaning the grain. There are three categories of such shops, A, B and C. In Dhanipur 36 'A' grade, 66 'B' grade and 30 'C' grade shops are found and in Khair 10 'A', 30 'B' and 20 'C' grade shops, in Chharra 20 'A', 37 'B' and 44 'C' grade shops, while in Atrauli 'A' grade shops are not available 'B' grade are 10 and 'C' grade shops are 30 respectively.

Table 4.1 Infrastructural Facilities in the Regulated Markets of Aligarh District

S. No.	Infrastructural Facilities	Dhanipur	Chharra	Khair	Atrauli
1	Own Site	Y	Y	Y	Y
2	Own Office Building	Y	Y	Y	Y
3	Yard Fencing Compound Wall	Y	Y	Y	Y
4	Auction Platforms	Y	Y	Y	Y
5	Auction Halls	N	N	N	N
6	Internal Pucca Roads	Y	Y	Y	Y
7	Lighting Facility	Y	Y	Y	Y
8	Sanitary Arrangements	Y	Y	Y	N
9	Commission Agents Blocks	Y	Y	Y	Y
10	Drinking Water/Cooler	Y	Y	Y	Y
11	Canteen	Y	Y	Y	Y
12	Post Office	Y	N	Y	N
13	Bank	Y	N	Y	N
14	Library	N	N	N	N
15	Farmer's Rest House	Y	N	Y	N
16	Telephone	Y	Y	Y	N
17	Fire Prevention Devices	Y	Y	Y	Y
18	Parking Space	Y	Y	Y	Y
19	Cattle Shed	Y	N	N	N
20	Security Force	N	N	N	N
21	Weighment Facility	Y	Y	Y	Y
22	Godown and Warehouses	Y	N	Y	Y
23	Veterinary Hospital	N	N	N	N
24	Radio and Loud speakers	Y	N	Y	N
25	Chaukidar Posts	Y	N	Y	N
26	Guest House	Y	N	Y	N
27	Watchman Room	Y	N	Y	N
28	Platform for Trees	N	N	Y	N

Source: Records of the Market Committee (2004-2005) **Y- Yes N-No**

(c) Storage Godown

In Dhanipur market only one godown has been provided to 'Tarai Vikas Nigam', and the storage capacity of this godown is 1000 metric tonnes.

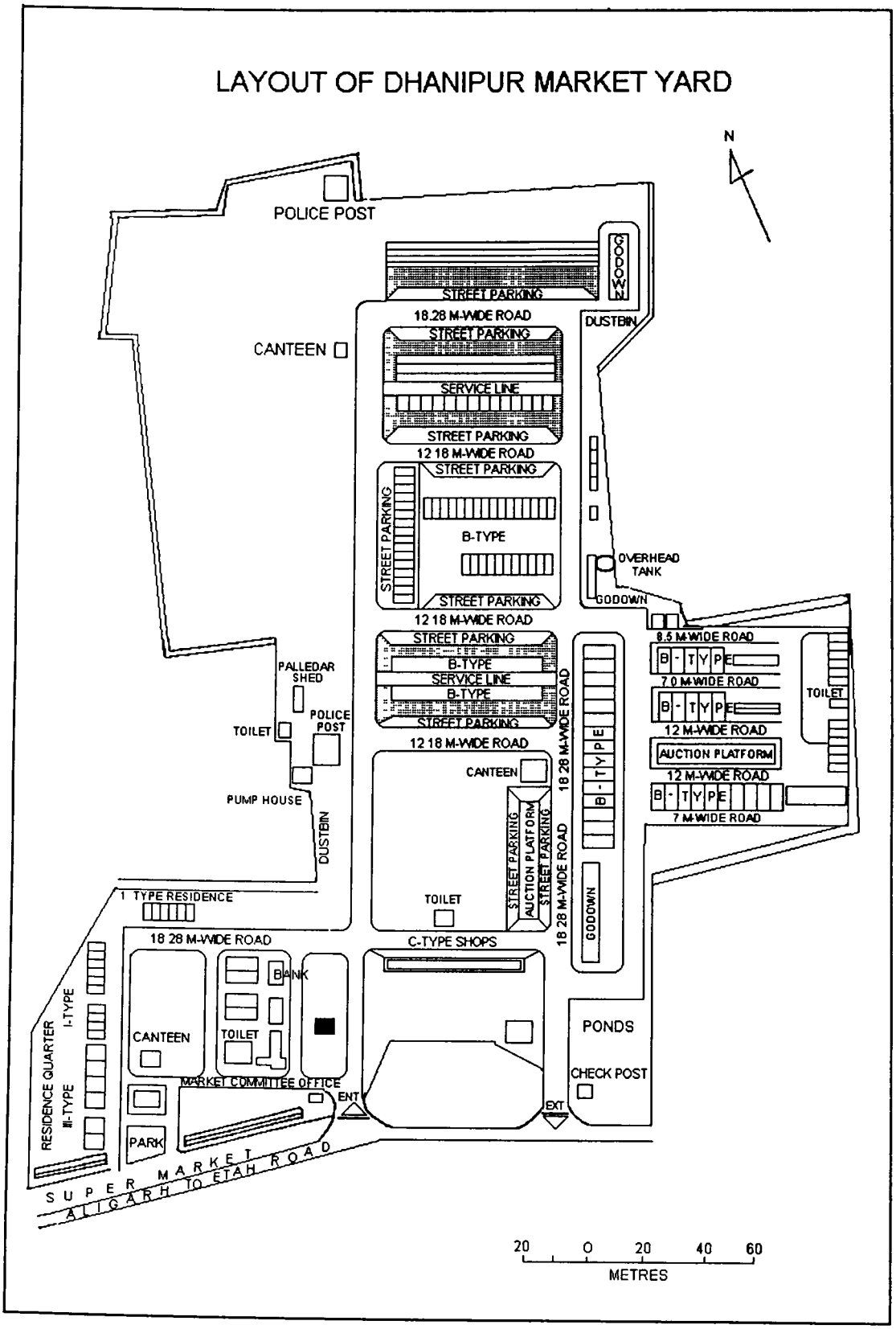
LAYOUT OF DHANIPUR MARKET YARD
N
POLICE POST
GODOWN
STREET PARKING
18.28 M-WIDE ROAD
DUSTBIN
CANTEEN
SERVICE LINE
12 18 M-WIDE ROAD
B-TYPE
OVERHEAD TANK
PALLEDAR SHED
TOILET
POLICE POST
PUMP HOUSE
8.5 M-WIDE ROAD
7.0 M-WIDE ROAD
12 M-WIDE ROAD
AUCTION PLATFORM
7 M-WIDE ROAD
1 TYPE RESIDENCE
C-TYPE SHOPS
BANK
PONDS
CHECK POST
MARKET COMMITTEE OFFICE
ENT
EXT
PARK
RESIDENCE QUARTER
I-TYPE
II-TYPE
SUPER MARKET
ALIGARH TO ETAH ROAD
20 0 20 40 60
METRES

Fig 4.2

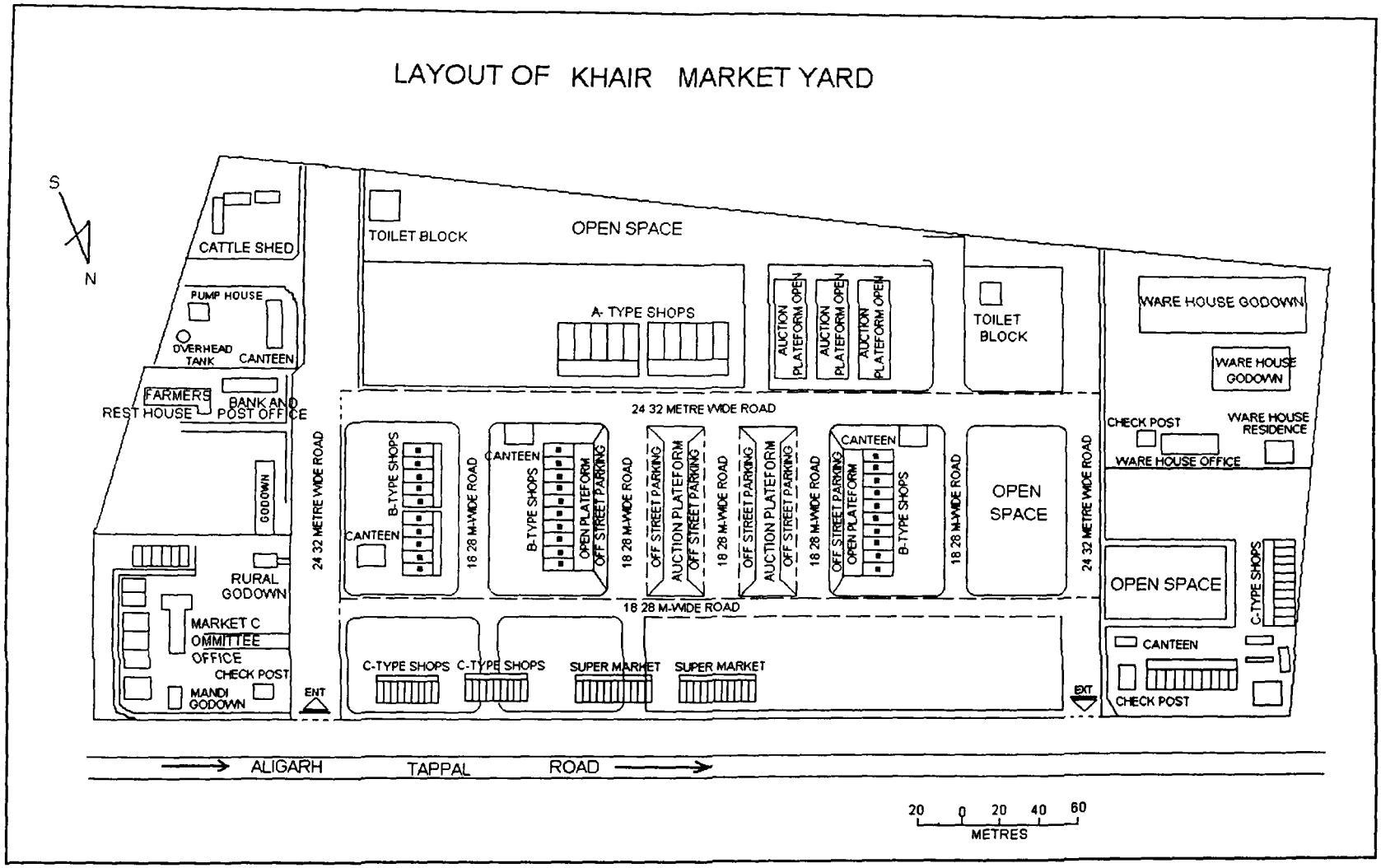
LAYOUT OF KHAIR MARKET YARD
S
N
CATTLE SHED
PUMP HOUSE
OVERHEAD TANK
CANTEEN
FARMERS REST HOUSE
BANK AND POST OFFICE
GODOWN
RURAL GODOWN
MARKET COMMITTEE OFFICE
CHECK POST
MANDI GODOWN
ENT
24 32 METRE WIDE ROAD
TOILET BLOCK
OPEN SPACE
A- TYPE SHOPS
AUCTION PLATEFORM OPEN
AUCTION PLATEFORM OPEN
AUCTION PLATEFORM OPEN
TOILET BLOCK
WARE HOUSE GODOWN
WARE HOUSE GODOWN
CHECK POST
WARE HOUSE RESIDENCE
WARE HOUSE OFFICE
24 32 METRE WIDE ROAD
B-TYPE SHOPS
CANTEEN
18 28 M-WIDE ROAD
CANTEEN
B-TYPE SHOPS
OPEN PLATEFORM
OFF STREET PARKING
18 28 M-WIDE ROAD
OFF STREET PARKING
AUCTION PLATEFORM
OFF STREET PARKING
18 28 M-WIDE ROAD
OFF STREET PARKING
AUCTION PLATEFORM
OFF STREET PARKING
18 28 M-WIDE ROAD
CANTEEN
OFF STREET PARKING
OPEN PLATEFORM
B-TYPE SHOPS
18 28 M-WIDE ROAD
OPEN SPACE
24 32 METRE WIDE ROAD
18 28 M-WIDE ROAD
OPEN SPACE
C-TYPE SHOPS
CANTEEN
CHECK POST
C-TYPE SHOPS
C-TYPE SHOPS
SUPER MARKET
SUPER MARKET
EXT
ALIGARH TAPPAL ROAD
20 0 20 40 60
METRES

Fig 4.3

In Khair market two godowns have been constructed with storage capacity of 1000 metric tonnes each. Such godowns facilitate the farmers and traders. In Chharra market 10 storage godowns are found under construction. And in Atrauli market one storage godown with a capacity of 7610 metric tonnes, is run by 'U.P. State Warehousing Corporation of India'. In Khair market 'Central Warehousing Corporation of India' run a storage godown with a storage capacity of 6500 metric tonnes.

4.3.2 Ancillary Premises

In all the regulated markets of the study area, there are so many ancillary premises are found such as check post, administrative building, guest house, farmers rest house, police post, bank, post office, canteen, public toilets, internal roads, off street parking, drinking water, electric supply, resting park, radio, newspaper, drainage and sanitation etc (Table. 4.1).

The above details of infrastructural facilities of regulated markets revealed that Dhanipur market tops among the other markets in respect of amenities and facilities provided to it, which is followed by Khair, Chharra and Atrauli. Atrauli market, occupies last place in terms of provision of amenities and facilities. It is observed that Khair market is the second biggest market of Aligarh district. The facilities like check post, administrative building, guesthouse, farmer's rest house, canteen, internal roads, parking space, drinking water facility, public toilets are available in all the markets of the district. The important requirements like covered space for storage, is not found in Atrauli and Chharra regulated market and warehousing facility in Dhanipur and Chharra regulated market.

It is to be noted here that the facilities like bank, post office, veterinary hospital, first aid, library, television, radio, fire prevention devices, cold storage are neglected in most of the markets.

It is common to find that except Dhanipur, all the markets are not kept clean. On the whole it can be concluded that no market is able to provide all the listed facilities.

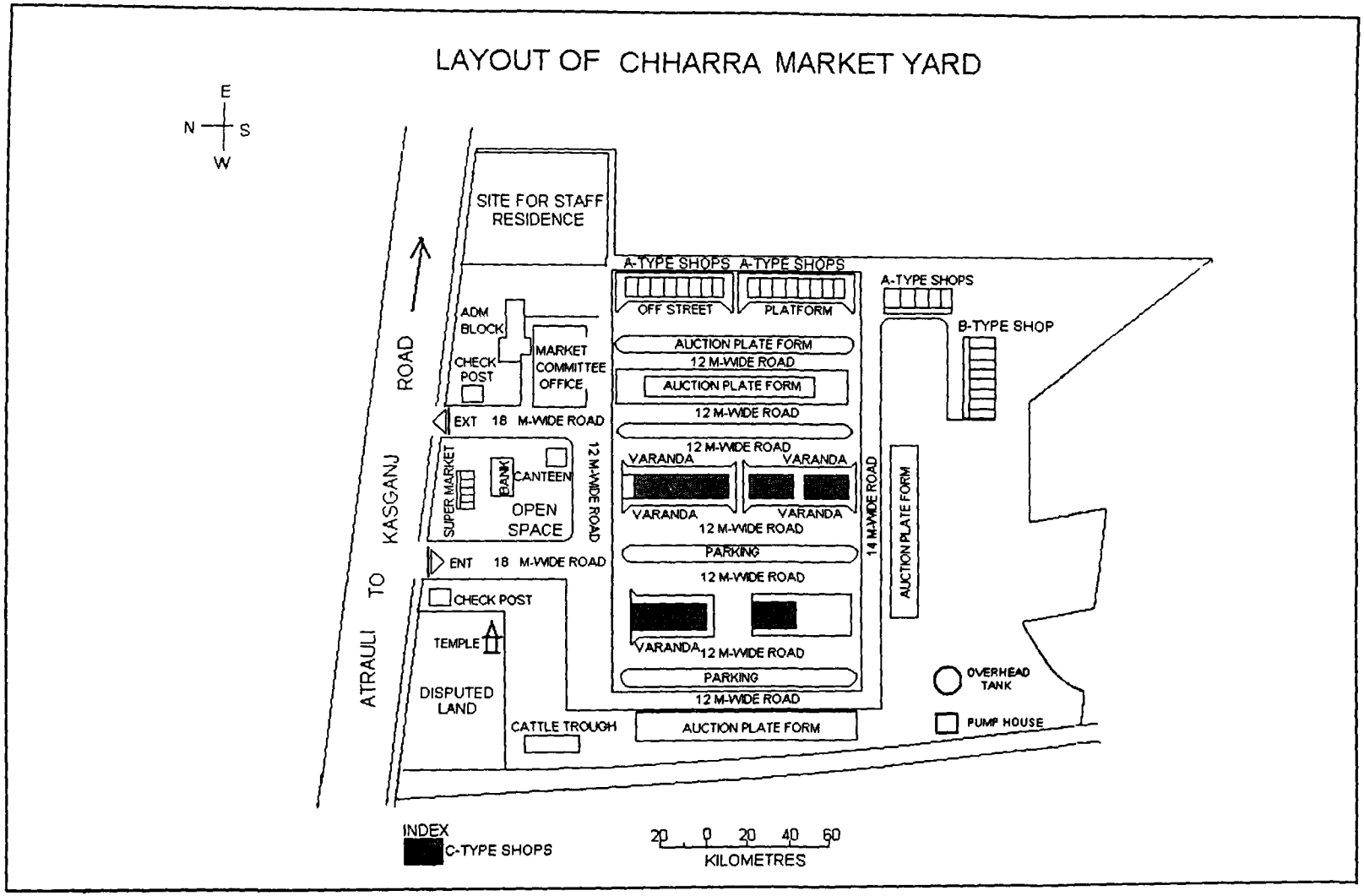
LAYOUT OF CHHARRA MARKET YARD
E
N
S
W
SITE FOR STAFF RESIDENCE
A-TYPE SHOPS
A-TYPE SHOPS
A-TYPE SHOPS
OFF STREET
PLATFORM
B-TYPE SHOP
ADM BLOCK
CHECK POST
MARKET COMMITTEE OFFICE
AUCTION PLATE FORM
12 M-WIDE ROAD
AUCTION PLATE FORM
12 M-WIDE ROAD
EXT 18 M-WIDE ROAD
12 M-WIDE ROAD
VARANDA
VARANDA
SUPER MARKET
BANK
CANTEEN
OPEN SPACE
12 M-WIDE ROAD
VARANDA
VARANDA
12 M-WIDE ROAD
14 M-WIDE ROAD
AUCTION PLATE FORM
PARKING
ENT 18 M-WIDE ROAD
12 M-WIDE ROAD
CHECK POST
TEMPLE
VARANDA
12 M-WIDE ROAD
PARKING
OVERHEAD TANK
DISPUTED LAND
12 M-WIDE ROAD
CATTLE TROUGH
AUCTION PLATE FORM
PUMP HOUSE
ATRAULI TO KASGANJ ROAD
INDEX
C-TYPE SHOPS
20 0 20 40 60
KILOMETRES

Fig 4.4

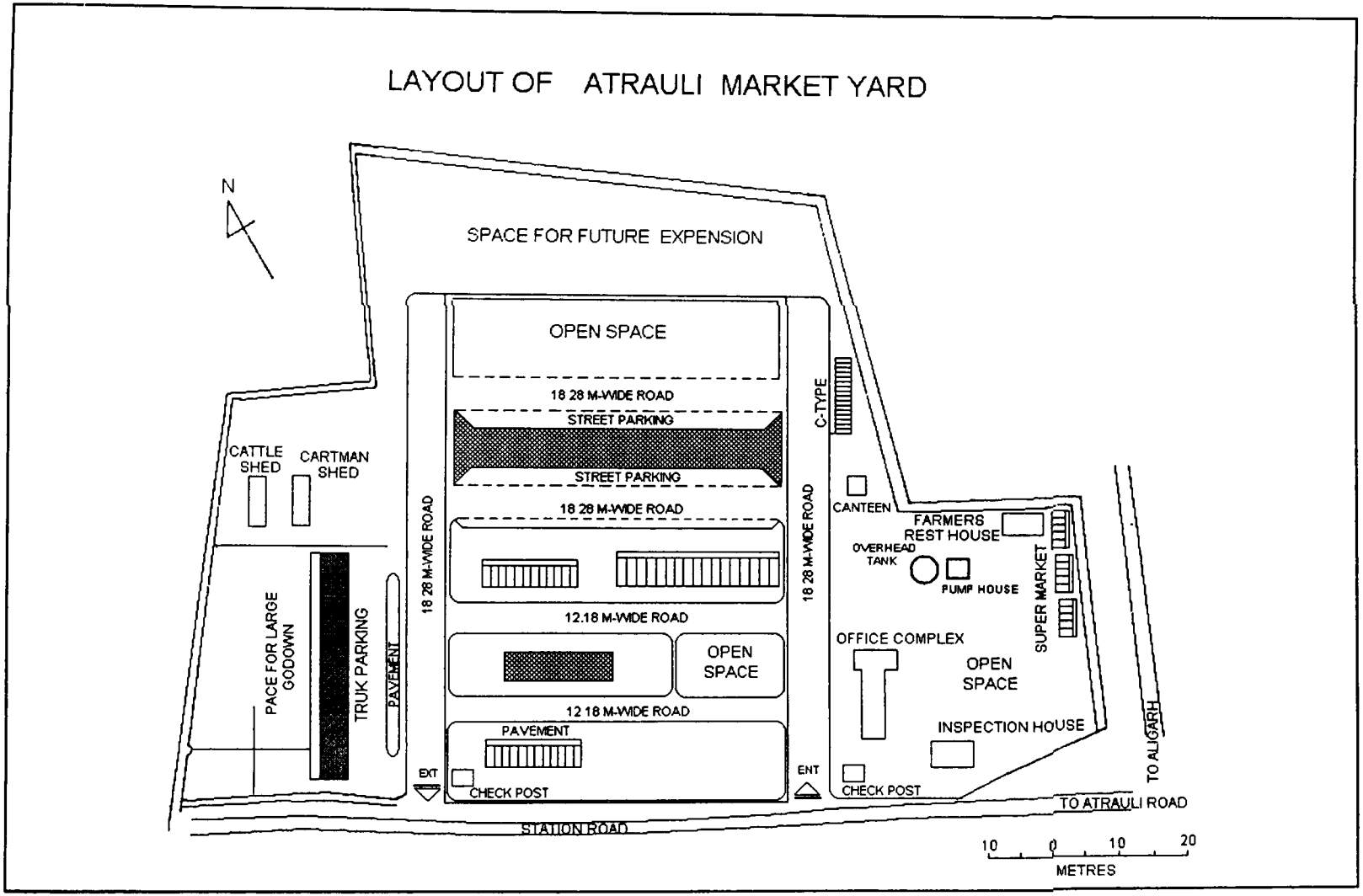
LAYOUT OF ATRAULI MARKET YARD
N
SPACE FOR FUTURE EXPENSION
OPEN SPACE
18 28 M-WIDE ROAD
STREET PARKING
STREET PARKING
18 28 M-WIDE ROAD
12.18 M-WIDE ROAD
12 18 M-WIDE ROAD
PAVEMENT
CHECK POST
EXT
ENT
CHECK POST
C-TYPE
CANTEEN
FARMERS REST HOUSE
OVERHEAD TANK
PUMP HOUSE
SUPER MARKET
OFFICE COMPLEX
OPEN SPACE
INSPECTION HOUSE
OPEN SPACE
CATTLE SHED
CARTMAN SHED
PACE FOR LARGE GODOWN
TRUK PARKING
PAVEMENT
18 28 M-WIDE ROAD
18 28 M-WIDE ROAD
TO ALIGARH
TO ATRAULI ROAD
STATION ROAD
10 0 10 20
METRES

Fig 4.5

Therefore, there is a considerable gap between the desired amenities and the amenities actually provided in the market yard. Considering that most of the markets have crossed 12 years of age, the development achieved by way of creating physical facilities in their yards is unimpressive and leaves much to be desired.

4.4 Proportion of Marketed Surplus in Regulated Markets

Agricultural products are marketed through different agencies in the study area. There is a channel through which the commodities move from the farmers' house to the ultimate consumers. The agencies through which the agricultural products are sold may be classified as under; formal agencies (Public Trading System) and informal agencies (Private Trading System)

4.4.1 Formal Agencies

The formal agencies include the government purchase agencies, semi-government agencies like Food Corporation of India (FCI), State Food Corporation (SFC), Regulated Market, Cooperative Societies, and State Agro etc. Formal agencies have come into existence with a view to ensure fair price for the producers surplus as an incentive to increase the agricultural production, to supply essential commodities to the consumer at reasonable price, to minimize seasonal fluctuation in price and to undertake procurement for maintenance of buffer stock. All these trading agencies undertake the purchase of different commodities under the scheme of procurement and minimum support price declared by either the central or the state government.

Regulated markets are one of the most important agencies of agricultural marketing system and they come under the category of formal agencies. They have accounted for transaction of 1127061 quintals of wheat, 367449 quintals of paddy/rice, 101781 quintals of maize, 118063 quintals of pulses, 249864 quintals of potato, 37255 quintals of onion and 289990 quintals of green vegetables of the total transaction of marketed surplus of these agro-commodities respectively through formal system during 2004-2005 (Table 4.2). Other government agencies like Central Warehouse, U.P. Agro, State Warehouse, R.F.C, P.C.F, U.P.S.S and F.C.I, marketing have made a purchase

of only food grains to minimize seasonal fluctuation and to undertake procurement for maintenance of buffer stock. They have purchased 2150, 27778, 9671, 24523, 49020, 36693, 11991 quintals of food grains respectively during the same period.

Table 4.2 Purchase of Major Agricultural Commodities by Different Agencies in Aligarh District (2004-2005)

S N	Marketing Agencies	Food Grains			Pulses	Potato	Onion	Green Vegetables
1	**Formal Agencies**	-						
a	Central Warehouse	2150			-	-	-	-
b	U.P. Agro.	27778			-	-	-	-
c	State Warehouse	9671			-	-	-	-
d	R.F.C.	24523			-	-	-	-
e	P.C.F.	49020			-	-	-	-
f	U.P.S.S.	36693			-	-	-	-
g	F.C.I.	11991			-	-	-	-
h	Marketing	-			-	-	-	-
i	Regulated Markets	Wheat	Rice/ Paddy	Maize	118063	249864	37255	289990
		1127061	367449	101781				
2	**Informal Agencies**							
a	Mills	-	-	-	-	-	-	-
b	I.T.C.	1750	-	-	-	-	-	-
c	Private Traders	-	-	-	-	-	-	-
d	Periodic Markets	412361	34127	18517	15720	122220	27620	237620
e	At Home	-	-	-	-	-	-	-

Source: District Statistical Magazine, Mandi Samiti Aligarh and Field Survey. ***(Weight in Quintals)***

4.4.2 Informal Agencies

In the informal agencies the purchasing agents work as an independent body. They are in themselves responsible for loss and profit in the trade. Wholesale traders, village traders, itinerant traders, commission agents and so on are included in the group of private trading agencies who purchase the agricultural surplus from producers at free rate on the basis of price agreement between producer sellers and buyers. This transaction takes place in the village as well as at market center. In this system the farmers, especially the small and marginal farmers, are exploited by the traders on account of their indebtness, small size of surplus and ignorance of market price and rules[1].

The informal agencies are concerned with private trading system. These are private mills, periodic rural markets, direct farm gate sale and so on. Periodic market is one of the important agencies of agricultural marketing

1. Amani, K. Z and Khan, N. (1989), Agricultural Marketing in Uttar Pradesh, The Geographer, Vol. xxxvi, No.2, pp.7-17.

system. It is found from the survey that only wheat (1750 quintals) has been purchased by I.T.C. It is followed by 412,361 quintals marketed surplus of wheat purchased in periodic markets through different informal marketing agencies in Aligarh district during 2004-2005. Similarly, rice/paddy has its share of 34,127 quintals, while maize 18,517 quintals, pulses 15,720 quintals, potato 122,220 quintals, onion 27,620 quintals and green vegetables 237,620 quintals respectively to the total transaction of marketed surplus in periodic markets during same period as evident from Table 4.2.

Table 4.3 indicates the proportion of marketed surplus at different stages of agricultural marketing agencies in Aligarh district. These stages of marketing agencies include direct purchase at home, village traders, village markets, wholesale markets, regulated markets, government agencies, town markets, mills, village shops, and cold storages in the study area. Regulated markets have recorded highest share of 42 per cent of marketed surplus of paddy/rice. While in village markets green vegetables have contributed in largest proportion of their total marketed surplus among different stages of marketing agencies in the study area. It is followed by onion with 24 per cent, potato with 18 per cent, wheat 15 per cent, maize and pulses 14 per cent and rice/paddy 2 per cent of their total marketed surplus respectively.

Table 4.3 Agricultural Products Marketed at Different Stages in Aligarh District (2004-2005)

S. No.	Market Agencies	Wheat	Rice /Paddy	Maize	Pulses	Potato	Onion	Green Vegetables
1	Consumer at Home	5	-	6	4	2	2	3
2	Village Traders	12	7	10	12	10	8	7
3	Village Markets	15	2	14	14	18	24	32
4	Wholesale Markets	10	18	19	16	20	18	13
5	Regulated Markets	36	42	37	39	35	36	35
6	Govt. Agencies	8	-	-	-	-	-	-
7	Town Markets	4	6	8	7	4	5	10
8	Mills	7	25	-	6	-	-	-
9	Village Shops	3	-	5	2	-	-	-
10	Cold Storage	-	-	-	-	11	7	-

Source: Field Survey 2004-2005. *(Unit in Per cent)*

The wholesale markets also play a very important role in the transaction of agricultural commodities. 20 per cent of marketed surplus of potato, 19 per cent of maize, 18 per cent of rice/paddy and onion, 16 per cent of pulses, 13 per cent of green vegetables and 10 per cent of wheat have been marketed through wholesale markets in the study area.

The village traders are found to be very important agent of marketed surplus of agricultural products in the study area. 12 per cent of marketed surplus of pulses and wheat, 10 per cent of potato and maize, 8 per cent of onion, 7 per cent of green vegetables and paddy/rice have been marketed through village traders in the villages especially by small and marginal farmers, who reported to have very small size of marketable surplus. This factor discourages them to sell their surplus in distant specialized agricultural markets to avoid unnecessary transport and time cost[1]. Town markets are also playing a very important role in the transaction of agricultural commodities in the study area. 10 per cent of green vegetables, 8 per cent of maize, 7 per cent of pulses, 6 per cent of rice/paddy, 5 per cent of onion and 4 per cent of potato and wheat are transacted through town markets in various parts of study area.

The purchase of agricultural products by consumers from the producer's house is another very important agent of agricultural marketing in the study area. Table 4.3 shows that 6 per cent of maize, 5 per cent of wheat, 4 per cent of pulses, 3 per cent of green vegetables and 2 per cent of potato and onion are transacted through direct marketing. In this marketing, margin of commission agents to consumer's price is reduced, as it is the smallest chain of all marketing channels. Therefore both farmers and consumers get benefited[2]. Besides, the time of consumers (usually agricultural and landless laborer) is also saved in which they can earn more wages. It is a dominant characteristic of

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1 Amani, K.Z and Khan, N (1993), Spatial Behaviour of Consumers and Traders in Periodic Markets in a North Indian State- A Case Study, Asian Profile, Vol.21, No.3, p.245.

2 Khan, N (1988), Direct Marketing in Agriculture in Faizabad District, The Geographer, Vol. xxxv, No.2, pp.68-79.

direct marketing especially between direct consumer and producer in Aligarh district.

4.5 Methods of Transaction in Regulated Markets

Many methods of sale are in vogue in different markets. Even in the same market, different methods are followed to different commodities. Every method of sale has its merits and demerits. Before any particular method is advocated, it would be desirable to briefly review the different methods. The various methods of sale are as follows:

(a) Under Cover Method

(b) Open Auction Method

(c) Private Negotiation

(d) Government Purchase

4.5.1 Under Cover Method

This is very old and primitive method, which is found in most of the regulated markets at present. In this method *arhatiya* forms group of buyers and sellers. He clasps their hands under a cover cloth, usually small towel or *dhoti* and presses the fingers on sellers palm to indicate the rate at which the buyer is ready to purchase.

Table 4.4 Method of Sale in Different Regulated Markets of Aligarh District (2004-2005)

S. N	Method of Sale	Dhanipur		Chharra		Khair		Atrauli	
		Food Grains	Vegetables	Food Grains	Vegetables	Food Grains	Vegetables	Food Grains	Vegetables
1	Auctioning	Y	Y	N	Y	N	Y	N	Y
2	Under Cover Method	N	N	Y	N	Y	N	N	N
3	Negotiation	N	N	N	N	N	N	Y	N
4	Govt. Purchase	Y	N	Y	N	Y	N	N	N

Source: Field Survey 2004-2005 *In Table Y used for yes and N used for no*

Table 4.4 shows that this method of transaction is in practice for food grains in Chharra, and Khair regulated market of Aligarh district. The prevalence of this method in the regulated markets shows the level of

corruption in these markets. The establishment of regulated markets is aimed at to save producers from all the prevalent malpractices.

4.5.2 Open Auction Method

This is also a wholesale trading process in which the buyer declares his bids aloud to auctioneer who may be an *arhatiya*, broker, or seller himself. The goods are usually sold to highest bidder. However in same market, double auction system prevails. At first, the market official auctions each heap of commodities to *dalal*/broker or wholesale trader, auctions his own purchase (from the first auction) to other buyers.

Table 4.4 shows that this method is practiced in Dhanipur regulated market for both food grains and vegetables while in Khair, Atrauli and Chharra this method of sale is only practiced for vegetables. This system of sale is preferred over all other systems because of the fact that it ensures fair dealing to all parties. This system should be prevailed in all the regulated markets and for all the commodities in the study area.

4.5.3 Private Negotiation

Under this system the seller may invite offers for his produce and sell to one who might have offered the highest price for the produce. It is most common in unregulated market.

This method of sale is in practice for the food grains only in Atrauli regulated market of study area (Table 4.4).

4.5.4 Government Purchase

The government agencies make purchase with a view to ensure fair price for producers' surplus, as an incentive to increase the production, supply of essential commodities to the consumer at reasonable price, to minimize seasonal fluctuation and to undertake procurement for maintenance of buffer stock. The main public trading agencies are F.C.I. (Food Corporation of India), S.F.C.(State Food Corporation of India). All these trading agencies undertake the purchase of different commodities under the scheme of procurement and minimum support price declared by government. This system of sale is found in Dhanipur, Khair and Chharra regulated markets for food grains only.

4.6 Market Functionaries

The farmer may be a specialist in raising crops, but not in marketing them. He has neither the knowledge of the marketing techniques, nor the ability of disposing the produce individually. For the marketing of his produce therefore, "he often has to engage an intermediary known as the *arhatiya* commission agent or broker, who negotiates on his behalf to settle the sale transaction with the buyer"[1]. This system of employing a commission agent or a broker is almost universally observed in all established wholesale trade centers.

Another equally important functionary in the marketing chain is the trader, who purchases commodities for sale with a profit motive. Such buyer may also act as a commission agent for other traders. In addition to these two principal functionaries there are also others viz., weigh men, *hamals*, warehousemen, surveyors, and transport agents etc., who render necessary services, essential in the course of transfer of produce from the farmer to the ultimate buyer.

The important functionaries which are involved in the agricultural marketing system especially in regulated markets are as follows:

(a) Commission Agents
(b) Traders
(c) Hamals or *Palledars*
(d) Warehousemen
(e) Brokers
(f) Weigh men
(g) Surveyor
(h) Transport Agencies

4.6.1 Commission Agent

Commission agent means "a person who, on behalf of another person and in consideration of a commission makes or offers to make a purchase or

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[1] Directorate of Marketing and Inspection: Working of Regulated Markets-Regulated Markets, Vol.ii, (1968), p.78.

sale of any agricultural produce, livestock or offers to do anything necessary for completing or carrying out such purchase or sale and includes *arhatiya*"[1].

There are two types of commission agents-*Katcha arhatiya* and *Pucca arhatiya*, acting as intermediaries between sellers and buyers of agricultural produce. While *katcha arhatiya* acts on behalf of the sellers, the *pucca arhatiya* acts on behalf of the buyers. However, it is not uncommon that the same commission agent may act as both *katcha arhatiya* and *pucca arhatiya.*

Table 4.5 shows that 150 commission agents are found in Dhanipur market, 71 in Chharra, market 75 in Khair market and only 15 in Atrauli regulated market of the study area.

Table 4.5 Market Functionaries in the Regulated Markets of Aligarh District (2004-2005)

S.No.	Market Functionaries	Dhanipur		Chharra		Khair		Atrauli	
		No.	%	No.	%	No.	%	No.	%
1.	The Wholesaler cum Commission Agent	291	21.36	81	16.33	94	17.27	6	2.18
2.	The Wholesaler	103	7.56	20	4.03	15	2.75	30	10.90
3.	Commission Agent	150	11.01	71	14.31	75	13.78	15	5.45
4.	Broker	5	0.36	-	-	-	-	2	0.72
5.	Transport Agency	2	0.14	-	-	-	-	-	-
6.	Warehousemen	-	-	-	-	-	-	-	-
7.	Weighmen	253	18.57	110	22.17	90	16.54	55	20
8.	Palledar (Hamal)	300	22.02	125	25.20	120	22.05	150	54.54
9.	Traders	258	18.94	89	17.94	150	27.57	17	6.18
	Total	**1362**	**100**	**496**	**100**	**544**	**100**	**275**	**100**

Source: Respective Market Centre (2004-2005)

4.6.2 Trader

Trader means "a person ordinarily engaged in the business of buying and selling of notified agricultural produce, livestock, products of livestock as a principal or as a duly authorized agent of one or more principals and includes a person ordinarily engaged in the business of processing of notified agricultural produce, or products of livestock[2]". The sub-classification of traders is made in the by laws of the respective market committees. The territorial limits of activities or the volume of business transacted served as the basis of this

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1 The Andhra Pradesh (Agricultural Produce and Livestock) Market Act, (1966), pp.42-43.

2 Andhra Pradesh (Agricultural Produce and Livestock) Market Act, (1966), Rule 2 (xxiii), p.45.

classification, intended to provide license fee variations on the principal of 'what the traffic could bear'.

Table 4.5 shows the number of traders in Dhanipur regulated market are 258, Chharra market are 89, Khair market are 150 and 17 are in Atrauli regulated market. The number of traders are declining according to the status of markets.

4.6.3 Hamals or *Palledar*

Hamals or *Palledars* are the market laborers who attend the collection and handling of produce in the market. They are licensed by the market committee to render service on wages in handling of a notified commodity in the market. They handle the produce for loading and unloading, cleaning, stocking, filling the bags etc. They are usually independent workers, though in certain cases they are permanent employees of commission agents. The charge paid to the *palledars* is known as *palledari*. Their charges are deduced from the producer sellers.

In Dhanipur regulated market 300 *palledars* are working, while in Chharra regulated market 125 *palledars*, Khair regulated market have 120 *palledars* and while in Atrauli regulated market 150 *palledars* are working (Table 4.5). Their *palledari* are deduced from producer's agro-commodities known as '*khonchi*'.

4.6.4 Warehousemen

Warehousemen means "a person who arranges for the storage of any notified commodity". This functionary is necessary when the produce is required to be kept in a godown for a certain period. He charges only the prescribed rates for storage and his duties and responsibilities are duly specified in the 'Manual for Warehousemen'. Strictly speaking, there are only a few persons who exclusively do warehousing business in the private sector since in most cases, the commission agents themselves provide the necessary storage facilities.

Table 4.5 explains that no warehousemen are found in any regulated market of the study area.

4.6.5 Broker or *Dalal*

A broker acts as middlemen between buyers and sellers. With his long experience in trade, he knows the seller's need and the buyer's requirements. He is also quite conversant with market practices and conditions and is in a position to interpret with some confidence of the trend of the market. His activity is confined only to bring together the sellers and buyers and finalize a sale and purchase transaction. He, unlike the commission agent, is not required either to advance money or to handle the produce or keep records and accounts of transactions. His remuneration consequently, is less than that of a commission agent, but it is in proportion to his duties and responsibilities. There are 5 brokers working in Dhanipur as well as 2 brokers in Atrauli regulated markets (Table 4.5).

4.6.6 Weighmen

The weighman is an important functionary. On his honesty and integrity depends the correct assessment of the weight of goods. He is also entrusted with the responsibility of checking the weights and scales prior to actual weighment and satisfies himself regarding their correctness. He is brought in as an independent agency to ensure the correct weighment of the produce sold by the producer sellers/sellers so as to protect them against manipulatory actions by the buyers and their accomplices. There are two classes of weighmen- 'A' class weighmen and 'B' class weighmen. 'A' class weighmen are entitled to weigh lots in the yards only, 'B' class weighmen are entitled to work in the market area excluding the market yard. 253 weighmen are doing work in Dhanipur regulated market, 110 weighman in Chharra regulated market, 90 weighman in Khair market and only 55 weighman in Atrauli regulated market of the study area.

4.6.7 Surveyor

A surveyor is a person who assesses the quality of any commodity. He is a technical person trained in the determination of quality factors of the produce. His services may be utilized in the case of disputes arising on account of variations in the quality of the produce as a result of admixture or otherwise.

In primary wholesale markets, brokers and commission agents themselves perform these duties and in such cases the brokerage and commission charges are inclusive of such survey charges. No surveyors are found in the regulated markets of Aligarh district.

4.6.8 Transport Agency

Transport agencies include truck owners, drivers, cart men etc. As the very name implies, these types of functionaries are engaged in the transport of produce from one place to another within the market area. They are responsible for the safety of the produce as well as the containers while in the transit. Their remuneration is fixed on a mutually agreed basis. Only two transport agencies are working in Dhanipur regulated market (Table 4.5).

4.7 Marketing Channels of the Agricultural Products

Generally, agricultural commodities namely wheat, paddy, rice, maize, pulses, potato, onion etc. undergo a change of ownership through time and space. The intermediaries are involved in passing of the commodities from producer to ultimate consumer through different market channels of the commodities. In Aligarh district following marketing channels have been identified for wheat, paddy, maize, pulses, potato and onion. They are as follows;

4.7.1 Marketing Channels for Paddy/Rice

(1) Producer→ Consumer (Direct Sale).

(2) Producer→ Village Trader→Wholesale Trader→ Mills→ Government Agencies→ Fair Price Shop→ Consumer.

(3) Producer→ Itinerant Trader→ Primary Wholesaler→ Miller→ Secondary Wholesaler→ Retailer→ Consumer.

(4) Producer→ Miller→ Wholesaler→ Retailer→ Consumer.

(5) Producer→ Miller→ Consumer.

(6) Producer→ Commission Agent→ Miller→ Wholesaler→ Retailer→ Consumer.

(7) Producer→ Government Agencies→ Miller→ Fair Price Shop→ Consumer.

(8) Producer→ Cooperative Marketing Societies→ Cooperative Processing Unit→ Wholesaler→ Retailer→ Consumer.

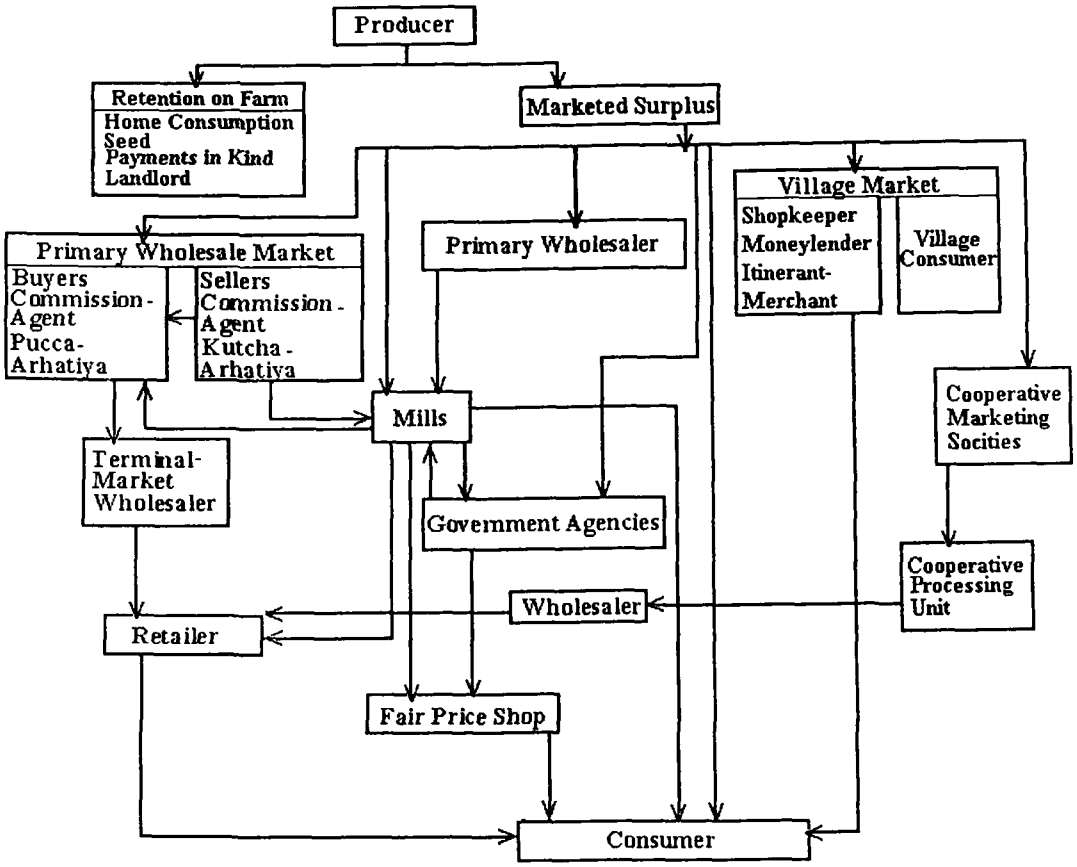

Fig 4.6 Channels for Paddy

4.7.2 Marketing Channels for Wheat

(1) Producer→ Consumer (Direct Sale)

(2) Producer→ Village Shopkeeper→ Village Trader→ Wholesaler Retailer→ Consumer

(3) Producer→ Itinerant Trader→ Wholesaler→ Retailer→ Consumer

(4) Producer→ Primary Wholesaler→ Secondary Wholesaler→ Retailer→ Consumer

(5) Producer→ Primary Wholesaler→ Miller→ Wholesaler→ Retailer→ Consumer

(6) Producer→ Primary Wholesaler→ Government Agencies→ Roller Flour Mill → Fair Price Shop→ Consumer

(7) Producer→ Government Agencies→ Fair Price Shop→ Consumer

(8) Producer→ Government Agencies→ Roller Flour Mill → Wholesaler→ Retailer→ Consumer

(9) Producer→ Periodic Market→ Consumer

(10) Producer→ Periodic Market→ Itinerant Trader→ Consumer

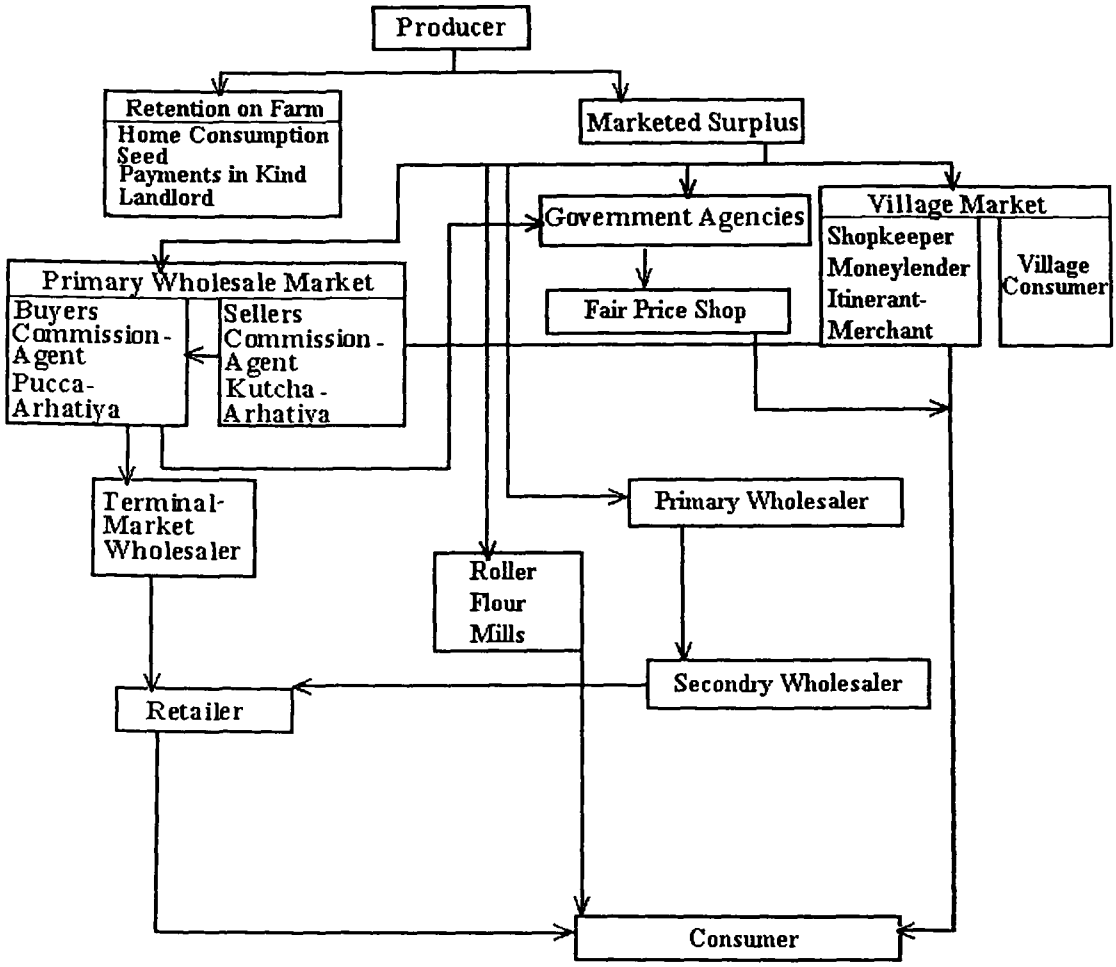

Fig 4.7 Channels for wheat

4.7.3 Marketing Channels for Maize

(1) Producer→ Consumer (Direct Sale)

(2) Producer→ Primary Market (Rural) → Secondary Market→ Wholesaler Commission Agent→ Wholesaler-Retailer→ Consumer.

(3) Producer→ Primary Market→ Secondary Market→ Wholesaler Commission Agent→ Retailer→ Consumer

(4) Producer→ Itinerant Merchant→ Village Shop→ Rural Consumer

4.7.4 Marketing Channels for Pulses

(1) Producer→ Consumer (Direct Sale)

(2) Producer→ Village Shopkeeper→ Village Trader Wholesaler→ Retailer→ Consumer

(3) Producer→ Itinerant Trader Wholesaler→ Retailer→ Consumer

(4) Producer→ Primary Wholesaler→ Secondary Wholesaler→ Retailer→ Consumer

(5) Producer→ Primary Wholesaler→ Consumer

(6) Producer→ Periodic Market→ Consumer

(7) Producer→ Periodic Market→ Itinerant Trader→ Consumer.

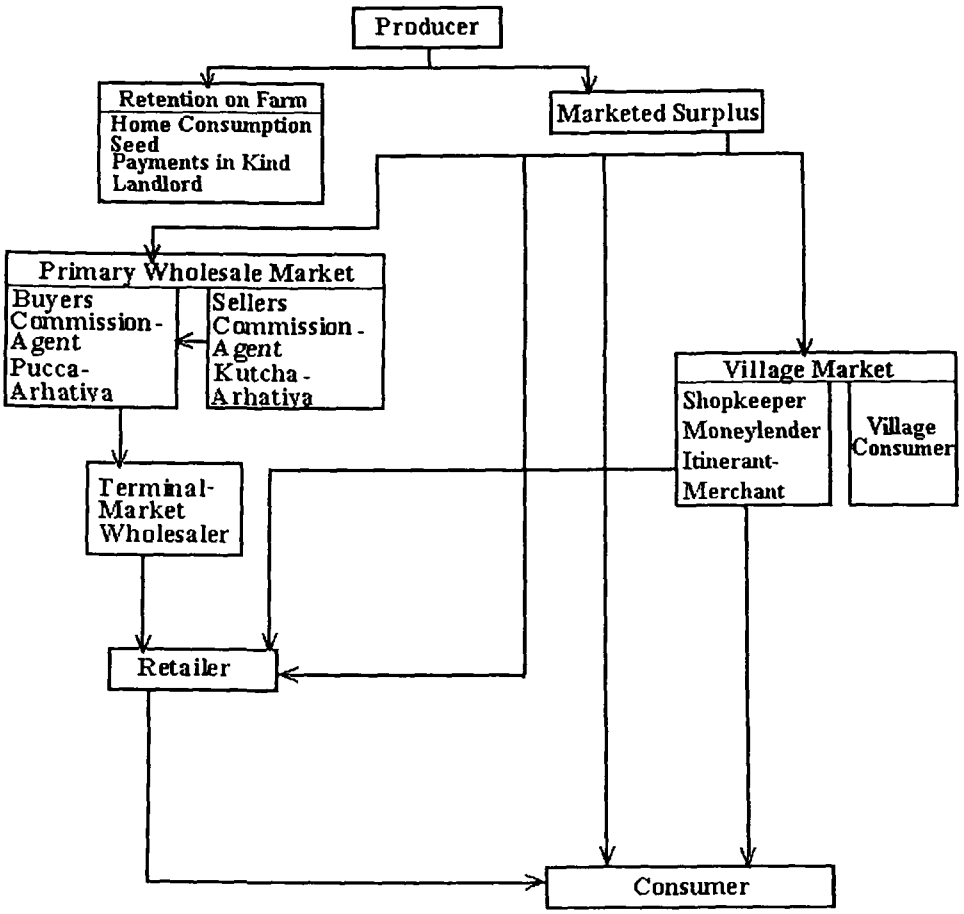

Fig 4.8 Channels for Maize

4.7.5 Marketing Channels for Potato and Onion

(1) Producer→ Consumer.

(2) Producer→ Village Trader→ Consumer.

(3) Producer→ Periodic Market→ Buying Trader→ Urban Consumer.

(4) Producer→ Town Market→ Consumer.

(5) Producer→ Cold Storage→ Wholesaler→ Retailer→ Consumer.

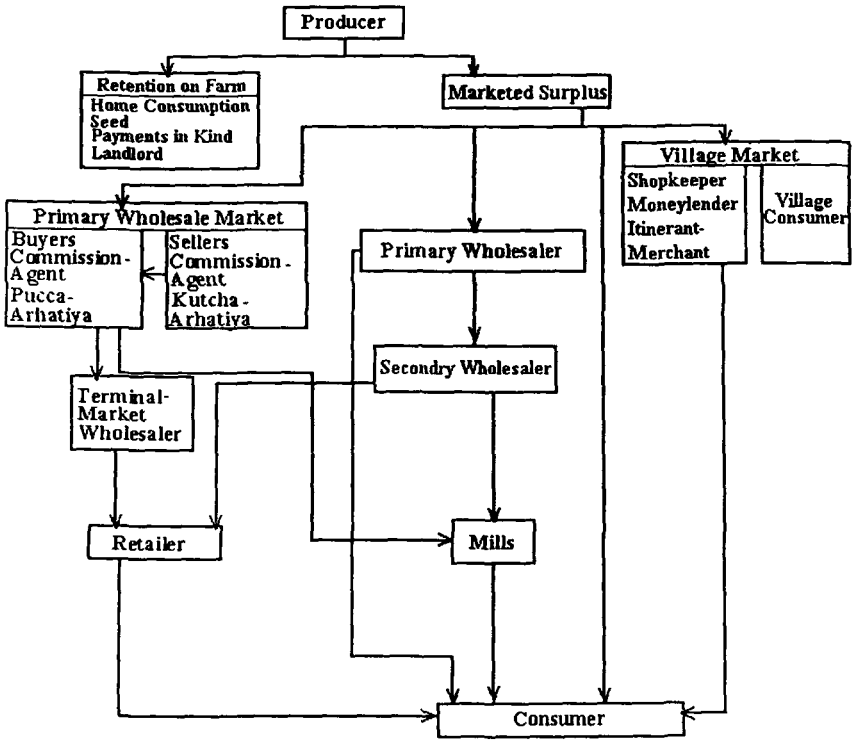

Fig 4.9 Channels for Pulses

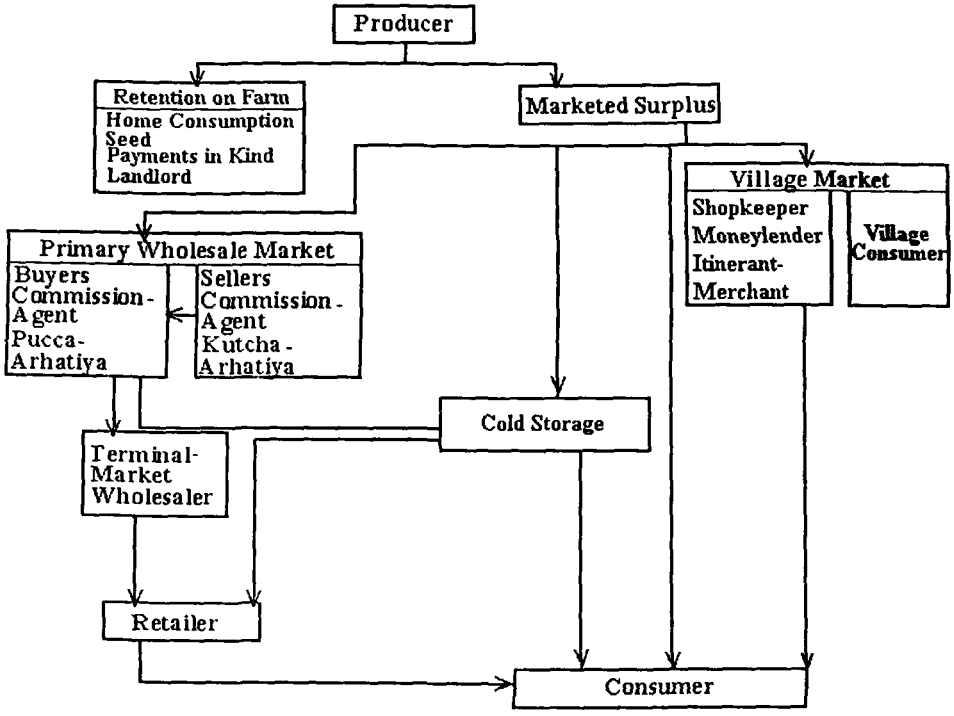

Fig 4.10 Channels for Potato and Onion

All the figures show that the length and structure of market channel vary with the nature of commodities. Food grains market channels are slightly different from vegetables market channels. Figures 4.6, 4.7, 4.8, 4.9, and 4.10 clearly indicates that regulated markets are very important channel for the transaction of different agricultural commodities in the study area.

References

Amani, K. Z and Khan, N. (1989), Agricultural Marketing in Uttar Pradesh, The Geographer, Vol. xxxvi, No.2, pp.7-17.

Amani, K.Z and Khan, N (1993), Spatial Behavior of Consumers and Traders in Periodic Markets in a North Indian State- A Case Study, Asian Profile, Vol.21, No.3, p.245.

Andhra Pradesh (Agricultural Produce and Livestock) Market Act, (1966), Rule 2 (xxiii), p.45

Andhra Pradesh (Agricultural Produce and Livestock) Market Act, (1966), pp.42-43.

Directorate of Marketing and Inspection: Working of Regulated Markets-Regulated Markets, Vol.ii, (1968), p.78.

Hodder, B.W (1965), Distribution of Markets in Yarubaland, Scott, Geog. Mag. Vol-81, pp-48-58.

Khan, N (1988), Direct Marketing in Agriculture in Faizabad District, The Geographer, Vol. xxxv, No.2, pp.68-79.

Sharma, S.K and Singh, D (2003), Spatio-Temporal Trend of Marketing of Agricultural Produce in Madhya Pradesh, The Geographer, Vol-50, No.1, pp-85-106.

CHAPTER-5

SPATIO-TEMPORAL PATTERNS OF MARKET ARRIVAL

5.1 Introduction

A regulated market, which satisfies all the conditions of market efficiency, attract greater amount of the marketable surplus of the notified commodities, because buyers and sellers would find it more advantageous position to deal the transactions in such a market. Ideally, an efficient market should attract the entire marketable surplus from its area. But due to various reasons it is beyond the control of regulated markets, to attract large amount of products and farmers from its hinterland. The market, which is closer to ideal condition, may be considered as an indicator of the better performance[1].

The indication of efficiency of a market is growing volume of turnover without any compulsion.[2] The progress, development, nature and status of a regulated market can be determined by volume and type of commodities arriving there for sale and purchase.

Market arrival refers the entry of marketable surplus of any commodity in the market for transaction. It is an important indicator to evaluate the status of markets. The market arrivals are very much unpredictable and fluctuate over time and space. Regulated market arrivals of various agro-commodities are very much impressive primarily due to fair dealings in the process of marketing as well as availability of various infrastructural facilities in the regulated markets like market yard, storage facilities, banking facilities etc. Therefore, the producer sellers will find more convenient to bring their produce in the market yard rather than dispose them off in their respective villages.

Market arrival can show the extent of the regulated market consciousness among the producers. The performance of regulated market can be judged by the volume of market arrival. It is an index of the producer's willingness to participate in the regulated market[3]. According to Joshi "the efficiency of regulated market can be tested by the extent of the participation

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1 Narasimha,M.G (1988), Regulated Market in a Rural Economy, Ajanta Publications, New Delhi, p.90.

2 Abbot, J.C (1958), Marketing Problems and Improvement Programmes, FAO Marketing Guide No.1, Food and Agricultural Organization, United Nations.

3 Arya, A (1993), Agricultural Marketing in Gujarat, Concept Publishing Company, New Delhi.

by the farmers in bringing their produce to the market for sale[1]". The market arrival is one of the performance variables of the regulated market.

At the very outset, it will be very useful to distinguish between primary arrival and secondary arrival. The primary arrival refers the marketable surplus or marketed surplus (which is actually put in the market for sale) brought by producers directly to the regulated market for sale and the secondary arrival means the marketable surplus brought by traders instead of producer sellers in the regulated markets[2].

This chapter is mainly devoted to the study of trends and patterns of market arrival in spatio-temporal dimension of the regulated markets of Aligarh district. The volume of business transacted and its character is the important indicator for assessing the role of regulated market or physical performance of the markets. An attempt has been made in this chapter to carry out in depth analysis to examine the behaviour of arrivals in the regulated markets of the study area.

The aspects covered in this chapter are as follows:

1. Trend and pattern of market arrival of agricultural commodities in the regulated markets.
2. Seasonal arrival of agricultural commodities in different regulated markets.
3. Spatial patterns of marketed surplus of agricultural commodities in the regulated markets.

On the basis of the arrival size of agro-commodities in all regulated markets of the study area, only nine major commodities namely paddy, wheat, maize, *arhar, moong*, mustard, groundnut, potato and onion have been selected for study. The spatio-temporal pattern of primary and secondary arrivals is identified on the basis of data available for the respective arrivals during 1991-92 to 2002-03, from the office of regulated markets of the study area.

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1 Joshi,B.D, Working of Regulated Markets in India, Vol.2, Market Series No.175, Nagpur, Department of Agriculture, Government of India.

2 Ibrahim,R (1984), Market Centers and Regional Development-A Case Study of Delhi-Jaipur-Agra Triangle, B.R.Publishing Corporation, Delhi, p.78

5.2 Trend of Market Arrival in Regulated Markets

An analysis of twelve years of data on the arrivals of agricultural commodities in the regulated markets of the study area shows wide fluctuations. Table 5.1 and fig 5.1 indicate that wheat is the most important food crop, had much variation in market arrival during 1991-92 to 2002-03. In 1991-92 the total wheat arrival was 392,787 quintals, while in 1996-97 it became 303,270 quintals and again reached the highest of 1,727,060 quintals in 2002-03. Paddy, the second ranked food crop, also recorded temporal variation in arrival in the regulated markets during same period. Its market arrival was 23,444 quintals in 1991-92 and the highest arrival was 467,375 quintals received in 1999-2000 and after two years its arrival went down to 444601 quintals in 2002-03.

Table 5.1 Trend of Primary Arrival of Agro-Commodities in Regulated Markets of Aligarh District (1991-2002)

(In Quintals)

Years	Food grains			Pulses		Oilseeds		Vegetables	
	Paddy	Wheat	Maize	Arhar	Moong	Mustard	G.Nut	Potato	Onion
1991-92	23444	392787	96344	103953	66904	360168	64	295147	14087
1992-93	52371	946681	832386	88498	23878	177994	3	2204398	19565
1993-94	57421	395056	127715	92053	25567	297573	47	170627	16316
1994-95	154624	393815	105636	118946	40430	184285	27	161185	19287
1995-96	62979	550193	102077	86143	23277	186441	6	190314	14633
1996-97	136191	303270	130747	79895	12417	165561	5	130301	25308
1997-98	264242	659370	189133	24133	22421	73575	5	133225	26907
1998-99	265833	785542	147428	20204	11633	166861	24	102689	17837
1999-00	467375	695663	125320	50789	6854	228087	569	189887	23771
2000-01	465462	879810	178935	70138	5142	189182	69	160025	22690
2001-02	449860	1062142	222731	94533	5348	212769	318	140363	35879
2002-03	444601	1727060	281781	99603	18460	289312	-	249864	37255

Source: Respective market place (Aligarh)

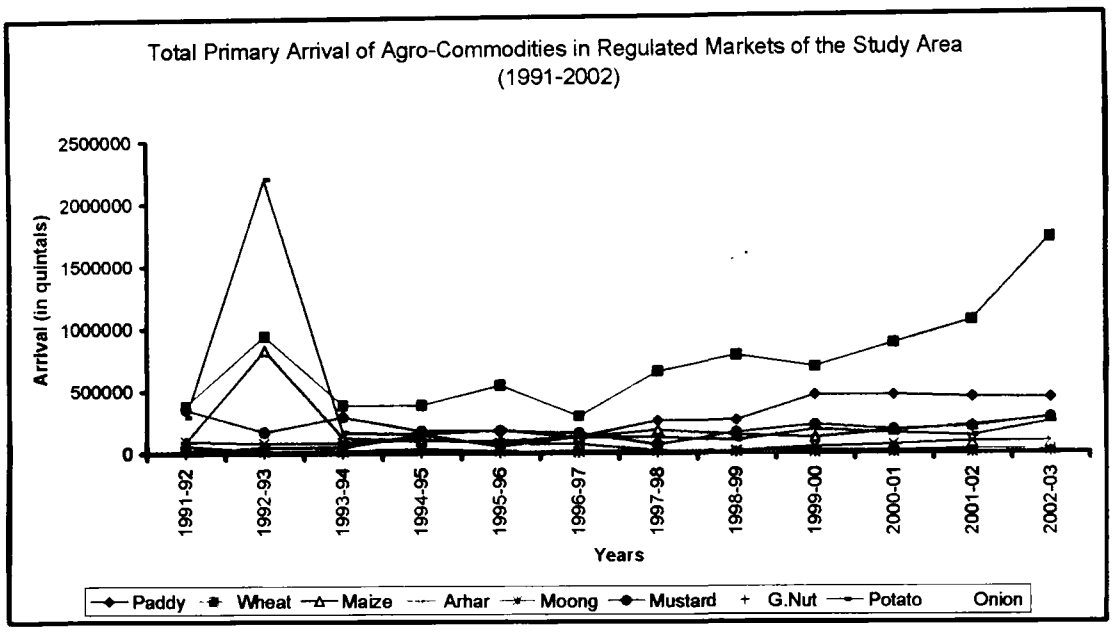

Fig 5.1

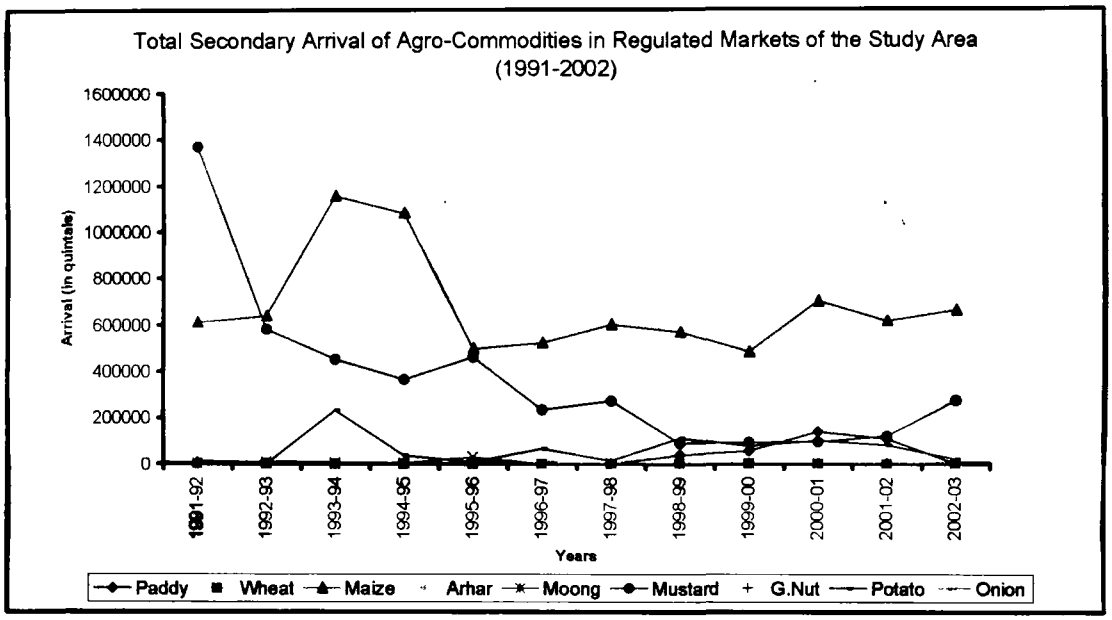

Fig 5.2

Maize is the third important food crop; their arrival during 1991-92 was 96344 quintals. The arrival of maize has increased many folds during 1992-93 i.e. 832,386 quintals. Its market arrival decreased during 1993-94 to 2000-01 and again it increased during 2002-03. Pulses include *arhar* and *moong* which registered decreasing trend in their market arrival of regulated market during discussed period. *Arhar* market arrival continuously decreased during study period except 1994-95. *Moong* has also registered decline in their market arrival from 66,904 quintals to 18,460 quintals. Similarly oilseeds which include mustard and groundnut registered very fluctuating trend in their market

arrival. Mustard market arrival continuously declined, while groundnut shows fluctuation in their market arrival. Moreover, vegetables which include potato arrival declined from 295147 quintals to 249864 quintals and onion market arrival trend has increased from 14087 quintals to 37255 quintals during discussed period.

Table 5.2 Trend of Secondary Arrival of Agro-Commodities in Regulated Markets of Aligarh District (1991-2002)

(In Quintals)

Years	Food grains			Pulses		Oilseeds		Vegetables	
	Paddy	Wheat	Maize	Arhar	Moong	Mustard	G.Nut	Potato	Onion
1991-92	8904	114	612728	11184	1834	1372598	2649	17681	5234
1992-93	-	3008	639484	12457	2200	583328	177	1721	50
1993-94	-	76	1158609	8110	2077	452816	2539	232998	4475
1994-95	-	-	1084417	4370	1796	365716	4298	38701	5333
1995-96	-	-	498934	31290	2372	462100	2324	8401	630
1996-97	-	-	522998	1226	1224	234850	2171	67102	1136
1997-98	-	-	602794	3355	1498	273213	4361	14666	808
1998-99	38310	1461	570219	117	738	88913	4844	111830	1034
1999-00	55910	959	484621	3038	543	94534	3261	77811	1221
2000-01	139658	-	703315	3191	764	95775	4549	101003	146
2001-02	108801	307	617003	1532	1276	121013	2572	81619	338
2002-03	1784	3554	664577	7269	2829	274598	3876	22208	-

Source: Respective market place (Aligarh)

It becomes clear from table 5.2 and fig 5.2 that trend of secondary arrival of foodgrains is not found much uniform except maize in which arrivals maintains uniform arrival trend during discussed period. Pulses include *arhar* and *moong* which have maintained almost uniform trend of market arrival during 1991-92 to 1995-96 and afterwards they registered declining trend in their arrival. Oilseeds trend of market arrival has also decreased, while in vegetable potato registered increasing trend in its market arrival during the discussed period.

The market arrival trend of both primary and secondary nature discussed here shows that there are wide fluctuations in market arrival of agro-commodities in the regulated markets of the study area. Fluctuation in market arrival trend is due to fluctuations in production. But overall performance of

the market arrival trend shows the positive growth in the arrival of commodities. Thus, increase in the arrival trend is the expression of increase in market catchments area as well as number of the farmers coming to the regulated markets in the study area.

5.3 Market-wise Arrival Trend of Agro-commodities

It is clear from the table 5.3 and figure 5.3 that Dhanipur regulated market is the leading regulated market in terms of the primary arrival of agricultural commodities in the study area. The trend of the market arrival at Dhanipur regulated market has increased from 2,723,964 quintals to 10,709,828 quintals during 1991-92 to 2002-03. Chharra regulated market ranks second in total market arrivals with 564,675 quintals to 693,017 quintals during study period respectively. Khair and Atrauli rank third and fourth in terms of market arrival of agricultural commodities. Their (Khair and Chharra) primary market arrivals are continuously increasing during 1991-92 to 2002-03. In Khair regulated market, trend of arrival increased from 274,535 quintal to 438,986 quintals, while in Atrauli their arrival was 32,397 quintal and it has increased to 223476 quintals. Trend of primary arrival is more pronounced in Atrauli regulated market than Khair regulated market.

Table 5.3 Market-wise Trend of Primary Arrival of Agro-Commodities in Regulated Markets (1991-2002)

(In Quintals)

Years	Regulated Markets				Total of the region
	Dhanipur	Khair	Chharra	Atrauli	
1991-92	2723964	274535	564675	32397	3595571
1992-93	2193649	567552	749097	38940	3549238
1993-94	2665236	346519	558931	51041	3621727
1994-95	3752077	384119	561791	68452	4766439
1995-96	4550652	380189	571589	99811	5602241
1996-97	5233068	341020	487902	102160	6164150
1997-98	6352809	753803	710192	137845	7954649
1998-99	7191090	419906	831056	209598	8651650
1999-00	7946023	436764	689789	196284	9268860
2000-01	8405153	504014	794820	228744	9932731
2001-02	9821064	510565	823802	225799	11381230
2002-03	10709828	438986	693017	223476	12065307

Source: Respective market place (Aligarh)

Table 5.4 indicates that Dhanipur is the biggest market in terms of secondary arrival of agricultural commodities, followed by Khair, Chharra and Atrauli regulated market. The trend of secondary market arrival is almost reversed and has continuously registered declining trend. Dhanipur secondary arrival trend declined from 957,328 quintals to 769,342 quintals. Khair has the secondary market arrival trend from 649,276 quintals to 252,644 quintals.

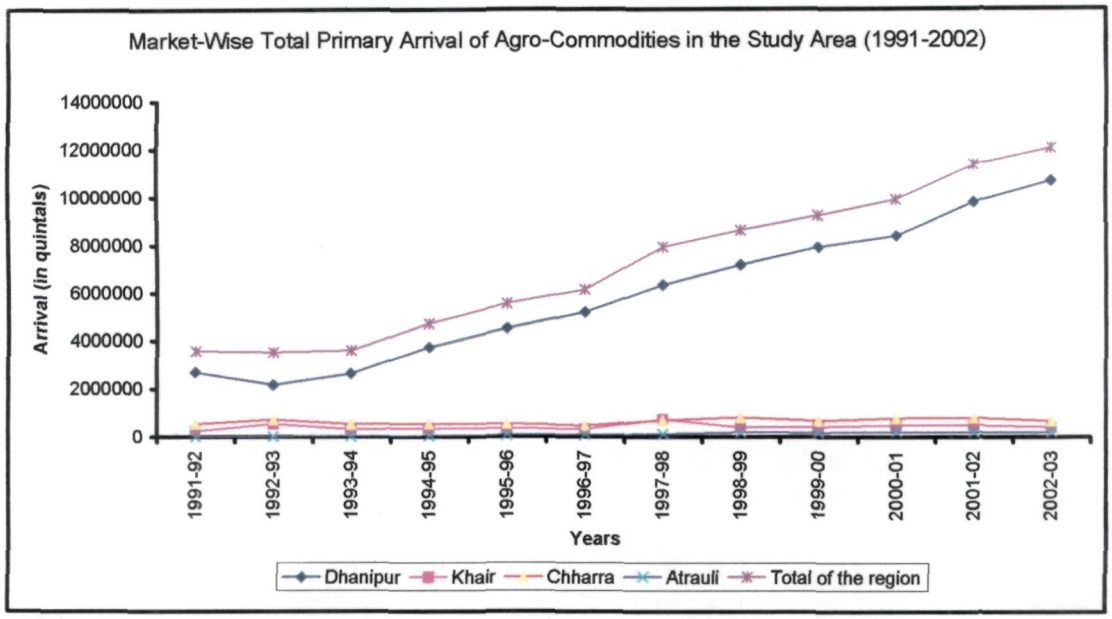

Fig 5.3

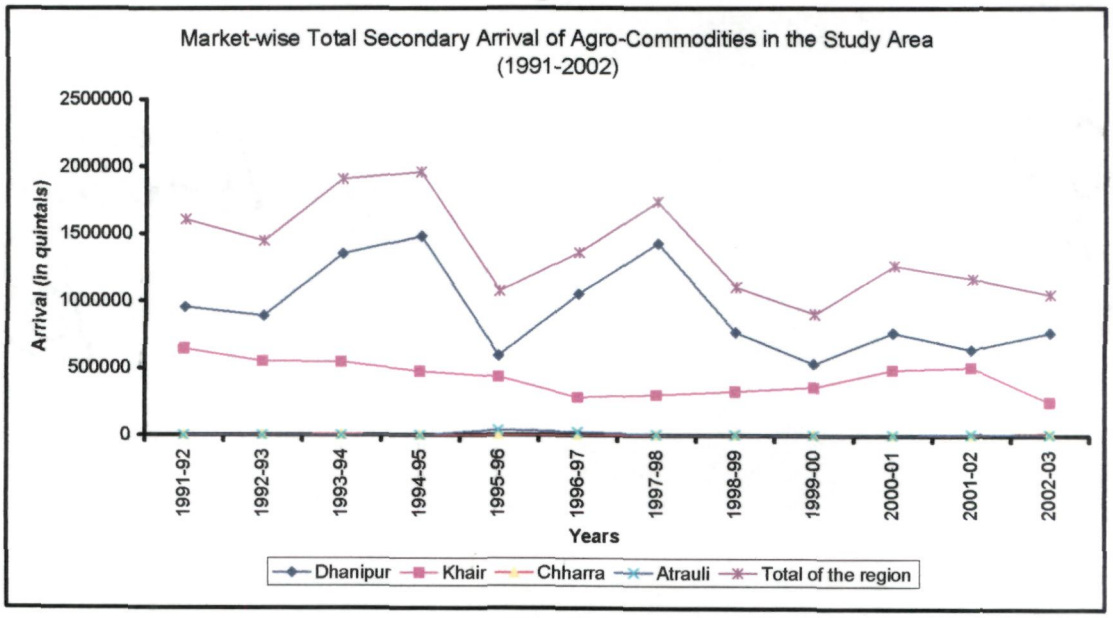

Fig 5.4

While Chharra and Atrauli regulated market arrivals were 4132 quintals to 19,305 quintals and 224 quintals to 9,814 quintals respectively during discussed period. Trend of primary arrival continuously increased while

secondary arrival trend decreased. Thus increasing primary market arrival shows increase in the number of farmers in the transaction of agro-commodities in the regulated markets.

Table 5.4 Market-wise Total Secondary Arrival of Agro-Commodities in Regulated Markets (1991-2002)

(In Quintals)

Years	Regulated Markets				Total of the region
	Dhanipur	Khair	Chharra	Atrauli	
1991-92	957328	649276	4132	224	1610960
1992-93	891046	555072	4056	90	1450264
1993-94	1353364	550442	9576	82	1913464
1994-95	1485432	478932	2121	0	1966485
1995-96	595863	438604	1571	39900	1075938
1996-97	1052829	284481	2283	22782	1362375
1997-98	1430601	304424	1559	5817	1742401
1998-99	769762	331026	783	4381	1105952
1999-00	536012	362898	5864	60	904834
2000-01	767140	491567	2496	5267	1266470
2001-02	641814	511384	3306	12173	1168677
2002-03	769342	252644	19305	9814	1051105

Source: Respective market place (Aligarh).

5.4 Commodity-wise Trend of Agro-Commodities Arrival

The analysis of commodity-wise arrival trend in regulated markets is important to understand the present pattern of market arrivals and their future planning. This analysis would also help in identification of regulated markets which have either large or small quantity of market arrivals trend of specific product. There are four regulated markets and six sub markets in the district of Aligarh. The data on the arrival trend of agricultural products of the four main regulated markets have been obtained from the respective markets office. The data base period selected for present analysis is twelve years i.e., from 1991-92 to 2002-2003.

5.4.1 Trends of Agro-Commodities Arrival in Dhanipur Regulated Market

Dhanipur regulated market provides wide range of goods and services which attract the countrymen from the surrounding areas. The arrival, of primary and secondary, marketable surplus of distinct agro-products in Dhanipur market is in highest quantum due to being located near city/town. The market serves large rural and urban population, 274 villages are under trade area of Dhanipur regulated market. An analysis of 12 years of data, on the

arrivals of agro-commodities in Dhanipur market shows a steady growth with a slight fluctuation in the arrival of food grains. The highest arrival of paddy and wheat was 358,720 quintals and 547,667 quintals in 2002-2003, while the lowest arrival of paddy was 22,833 quintals in 1995-96 and that of wheat was 40,391 quintals in 1996-97. The arrival of paddy and wheat has registered a significant growth of 1430 and 287 per cent (i.e., 23,435 quintals to 358,720 quintals) respectively between 1991-92 to 2002-2003. The highest arrival of maize was 716,286 quintals in 1992-93 and the lowest arrival was 16,416 quintals in 1998-99 with the growth of 218 per cent (i.e., from 24,679 quintals to 78,712 quintals between 1991-92 to 2002-2003). Data also reveals the fluctuation in the arrival of pulses and oilseeds. Figure 5.5 shows that the highest arrival of *arher* and *moong* was 58,448 and 18,385 quintals respectively in 1991-92, while the lowest arrival was 3,733 quintals in 1998-99 for *arhar* and 1,351 quintals in 1999-2000 for *moong* in Dhanipur regulated market. *Moong* and *arhar* registered their negative arrival of -12 and -30 per cent (i.e., 18,385 to 16,087 quintals respectively). The highest arrival of mustard and groundnut was 204,064 and 564 quintals during 1999-2000 and the lowest arrival was 23,095 quintals in 1997-98 for mustard and 8 quintals market arrival for groundnut in 1992-93. Mustard registered almost stagnation in their market arrival of only 3 per cent, while groundnut registered negative growth. The highest arrival of potato was 278,231 quintals in 1991-92 and the lowest market arrival was 68,101 quintals in 1998-99, while the highest arrival of onion was 35,430 quintals in 2002-03 and the lowest market arrival was 12,681 quintals in 1991-92 (Table 5.5 and Figure 5.5).

Table 5.6 and figure 5.6 explain that the secondary arrival of food grains especially wheat in regulated market is in larger quantity, whereas paddy and maize arrival are in negligible quantity in Dhanipur regulated market. The highest arrival of wheat was 4,571,139 quintals in 1992-93 and the lowest market arrival was 253,123 quintals in 1995-96. Paddy and maize registered negative growth in market arrival whereas pulses includes *arhar* and *moong* grew positively i.e., 31 and 24 per cent during same period. Same situation is

found with the vegetables especially potato and onion. The highest market arrival of potato was 82,479 quintals in 2000-2001 and the lowest market arrival was 6,316 quintals in 1997-98 in the Dhanipur market. The secondary arrival of pulses and oilseeds shows that farmers are growing both the crops for marketing purpose, that is why they sell both the commodities to traders to save themselves from marketing cost. The highest arrival of *arhar* was 31,262 quintals in 1995-96 and the lowest market arrival was 1262 quintals in 1996-97. The highest secondary arrival of potato was 82,479 quintals in 2000-2001 and the lowest market arrival was 6,316 quintals in 1997-98, in the Dhanipur market.

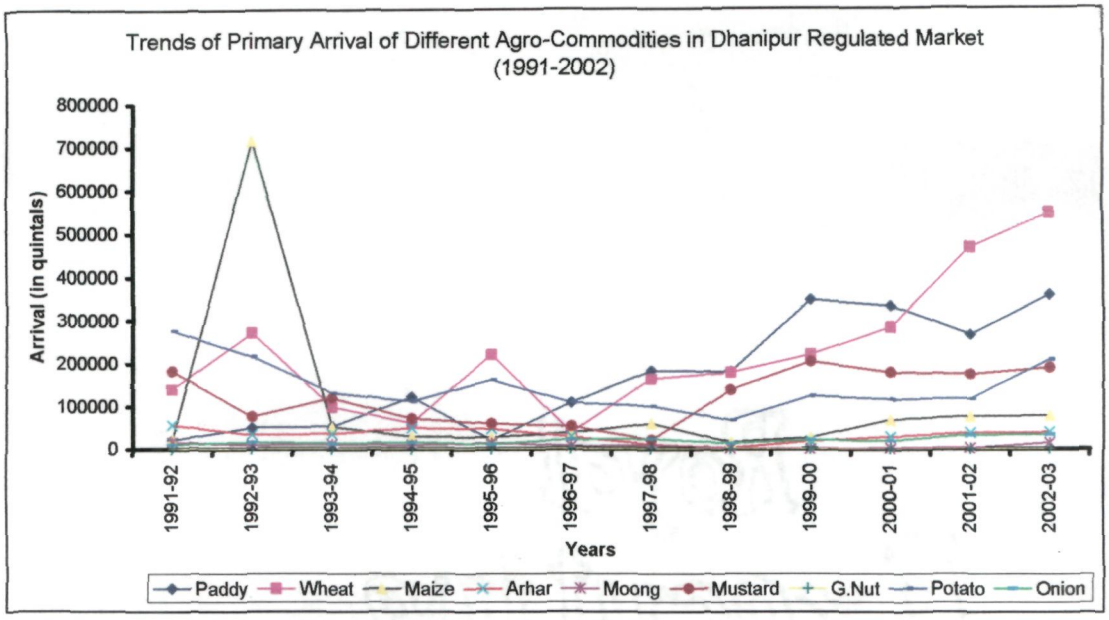

Fig 5.5

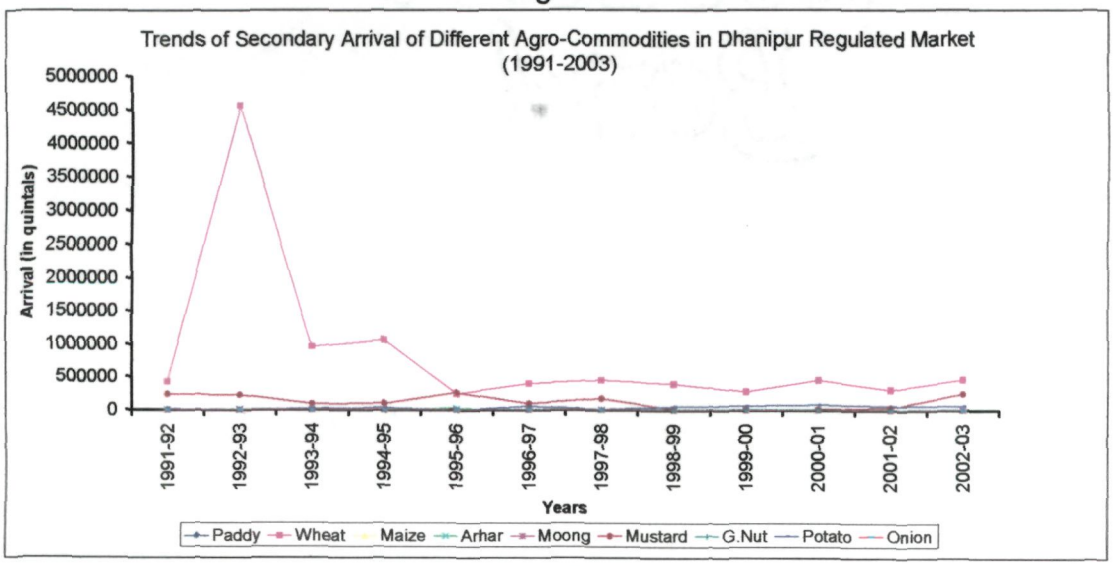

Fig 5.6

Table 5.5: Trends of Primary Arrival of Agro-Commodities in Dhanipur Regulated Market (1991-2002)

(In Quintals)

S.No.	Agro-commodities	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
1.	Paddy	23435	52356	54576	123248	22833	109461	182973	180647	347285	332473	265990	358720
2.	Wheat	141496	272634	100101	62794	221883	40391	164511	178600	220280	283505	468343	547667
3.	Maize	24679	716286	53545	30804	29155	39099	60563	16416	27841	69122	76755	78712
4.	Arhar	58448	36016	38122	51293	49246	30125	11744	3733	19429	29995	38934	40651
5.	Moong	18385	11508	13531	11095	16113	8603	9668	2903	1351	3590	3697	16087
6.	Mustard	184040	78125	120495	73351	61676	54451	23095	138374	204064	178454	174062	189626
7.	G.Nut	60	8	29	-	-	-	-	-	564	-	307	-
8	Potato	278231	217359	132776	113599	162515	109465	101245	68101	124415	116702	117814	208550
9	Onion	12681	18372	14861	17997	13430	23794	25090	14300	22012	20161	33812	35430

Source: *Respective market place (Aligarh).*

Table 5.6: Trends of Secondary Arrival of Agro-Commodities in Dhanipur Regulated Market (1991-2002)

(In Quintals)

S.No.	Agro-commodities	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
1.	Paddy	8904	-	-	-	-	-	-	6105	430	-	2763	550
2.	Wheat	434086	4571139	961230	1065266	253123	401171	453005	398395	280798	456886	310761	466222
3.	Maize	-	-	76	-	-	-	-	-	-	-	307	-
4.	Arhar	5543	12253	8046	4370	31262	1262	3205	1827	3038	3191	1472	7269
5.	Moong	1834	2200	2077	1796	2372	1224	1368	638	543	764	1276	2281
6.	Mustard	242234	229389	97607	104673	270335	101511	174664	12024	7436	12690	40231	250509
7.	G.Nut	2643	110	2507	2058	2242	2171	4342	4844	2261	4549	2572	3876
8	Potato	16200	-	21614	38481	-	58093	6316	53000	65847	82479	66045	70509
9	Onion	5229	-	4475	5333	600	1136	808	1034	1201	146	298	315

Source: *Respective market place (Aligarh).*

5.4.2 Trends of Agro-Commodities Arrival in Khair Regulated Market

Khair regulated market is located in western part of Aligarh district. It is second largest market of the district in terms of area. 261 villages are under the catchment area of this market. It is the third largest market after Dhanipur and Chharra in terms of market arrival. The reason behind this low market arrival is that, there is a better network of markets in Haryana and hence small hinterlands for this market.

It becomes clear from the table 5.7 and figure 5.7 that food grains especially wheat market arrival is in the largest quantity. The highest arrival of wheat was 301,500 quintals in 1992-93 and the lowest market arrival was 86,060 quintals in 1993-94 with the growth of 52 per cent during 1991-92 to 2002-2003. Second largest arrival of paddy which comes in the market was 94,172 quintals in 1999-2000, while the lowest market arrival in 1991-92 is 6 quintals. Third largest arrival of agro-commodities comes in Khair market is oilseeds, especially mustard was 116,950 quintals in 1991-92 and its lowest market arrival was 4,411 quintals in 2000-2001 registering a negative growth of -67 per cent. Vegetables especially potato has fourth place in market arrival.

The highest arrival of potato was 59,092 quintals in 1999-2000, and the lowest market arrival was 7,898 quintals in 1991-92 registering positive growth of 216 per cent. *Arhar* comes in the market on fifth place. The highest arrival of *arhar* was 27,916 quintals in 1996-97 and the lowest arrival was 4,684 quintals in 1998-99.

Table 5.8 and figure 5.8 show the secondary arrival of agricultural commodities in Khair regulated market. The second largest arrival after wheat, paddy, potato and maize which comes in the Khair market in the largest quantity is mustard. *Arhar, moong*, groundnut and onion use to come in the market in negligible quantity. The highest secondary arrival of mustard was 444,065 quintals which comes in 1991-92, and the lowest market arrival was 24,089 quintals in 2002-2003. Wheat and paddy are second and third place in terms of secondary arrival. The highest arrival of wheat was 306,242 quintals in 2001-2002 while the lowest arrival was 17,400 quintals in 1994-95.

Secondary arrival of potato has fourth place in the market. In 1998-99, potato came in the highest quantity i.e. 27,545 quintals, and the lowest arrival was 220 quintals in 1994-95. Fig 5.8 shows that maize, groundnut, *arhar,* onion rank fifth, sixth, seventh and eight respectively in terms of secondary market arrival. The secondary arrival of *moong* is totally absent in the Khair regulated market.

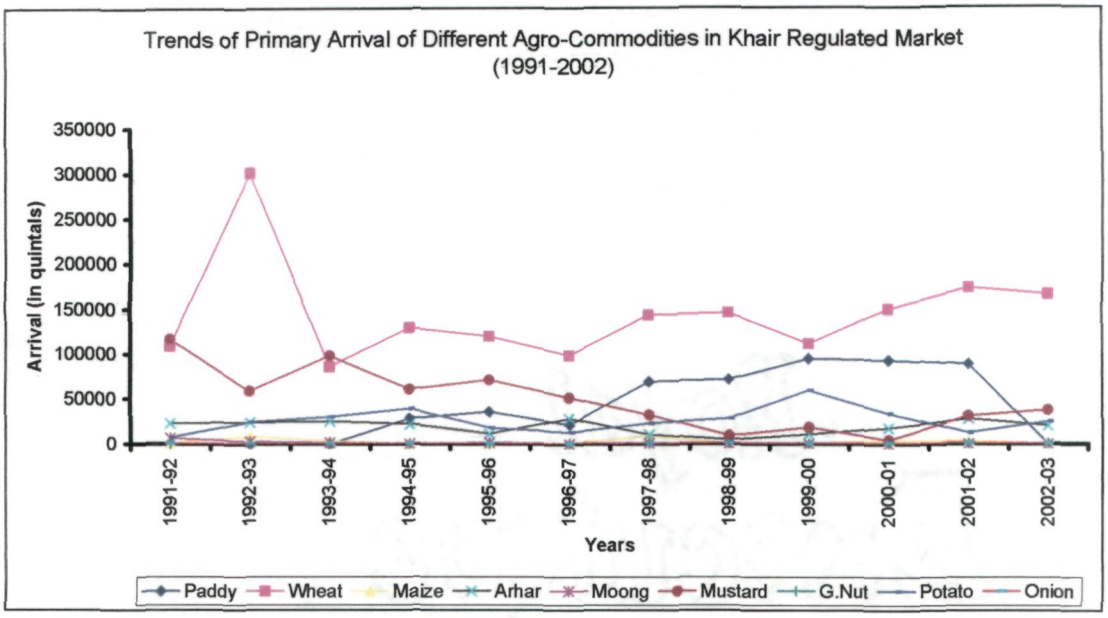

Fig 5.7

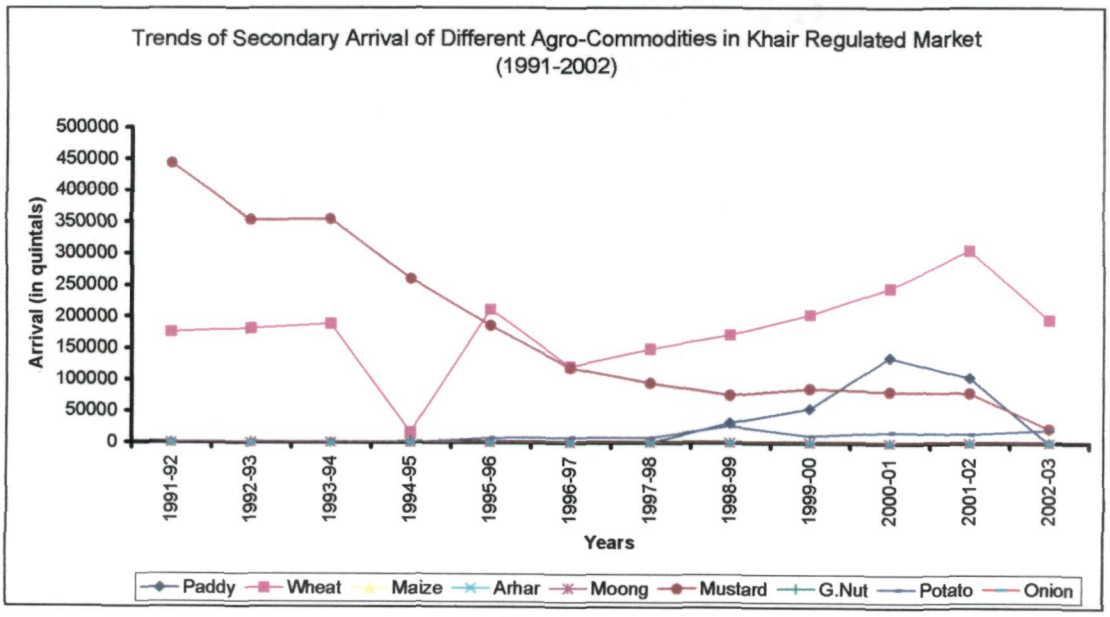

Fig 5.8

Table 5.7: Trends of Primary Arrival of Agro-Commodities in Khair Regulated Market (1991-2002)

(In Quintals)

S.No.	Agro-commodities	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
1.	Paddy	6	7	-	28520	35732	21118	68719	71227	94172	92295	88505	-
2.	Wheat	108869	301500	86060	129293	119584	98240	142852	145484	110851	149546	173415	166231
3.	Maize	1322	9227	3802	403	866	1098	8743	534	469	3946	3764	529
4.	Arhar	23217	24067	25094	22182	11414	27916	10091	4684	10688	17484	27752	20358
5.	Moong	7149	3119	1695	-	1910	10	839	-	-	-	-	-
6.	Mustard	116950	58984	98258	60930	71048	51273	32168	9374	18524	4411	31113	37841
7.	G.Nut	-	-	8	25	-	-	-	15	-	60	-	-
8	Potato	7898	24673	30374	39437	18279	13042	22784	28104	59092	33706	12710	24991
9	Onion	1156	912	917	820	557	664	807	1259	805	1204	1317	836

Source: *Respective market place (Aligarh).*

Table 5.8: Trends of Secondary Arrival of Agro-Commodities in Khair Regulated Market (1991-2002)

(In Quintals)

S.No.	Agro-commodities	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
1.	Paddy	-	-	-	-	-	-	-	32205	55322	137228	105028	-
2.	Wheat	176022	181545	189003	17400	212143	121827	149789	171824	203823	246429	306242	196067
3.	Maize	-	2357	-	-	-	-	-	-	959	-	-	-
4.	Arhar	49	204	-	-	-	-	150	90	-	-	-	-
5.	Moong	-	-	-	-	-	1	-	-	-	-	-	-
6.	Mustard	444065	353864	355209	261043	186391	120161	95562	76889	87098	83085	80782	24089
7.	G.Nut	6	53	32	2240	-	-	-	-	-	-	-	-
8	Potato	1481	1721	1684	220	7921	8949	8320	27545	11535	18404	15325	21956
9	Onion	5	50	-	-	30	-	-	-	20	-	-	-

Source: *Respective market place (Aligarh)*

5.4.3 Trends of Agro-Commodities Arrival in Atrauli Regulated Market

It is 'C' grade market of Aligarh district and 130 villages come under the catchments area of this market. The location of Atrauli regulated market is in the north-eastern part of the district. Table 5.9 and fig 5.9 show that wheat is the principal crop in the market arrival, which is followed by maize, potato and paddy. The highest market arrival of wheat and maize was 111,346, and 31,126 quintals in 1998-99 and 1999-2000 respectively and the lowest market arrival was 4,572 quintals and 454 quintals in 1992-93.

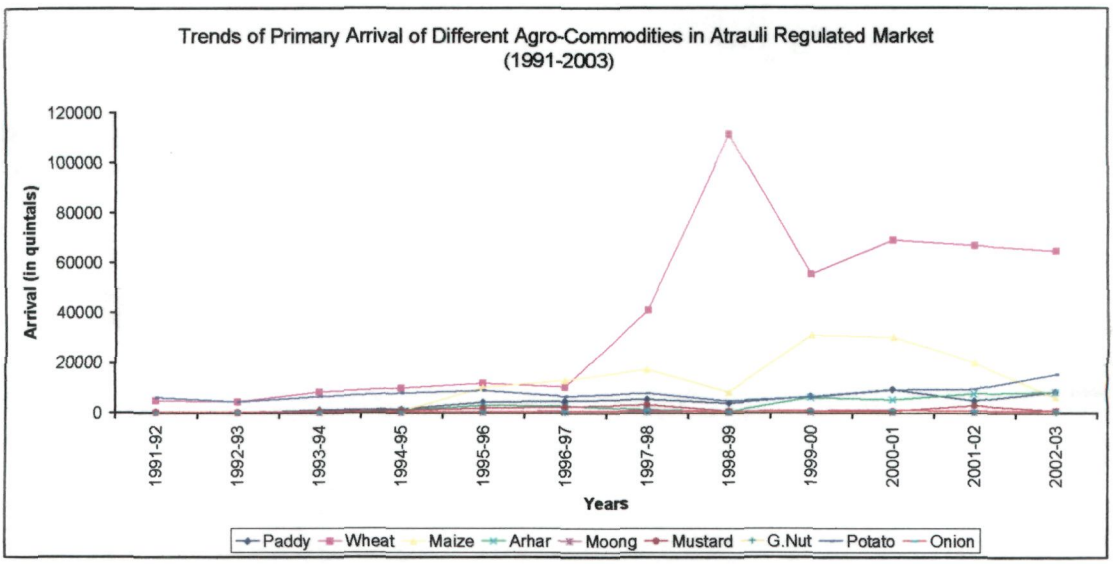

Fig 5.9

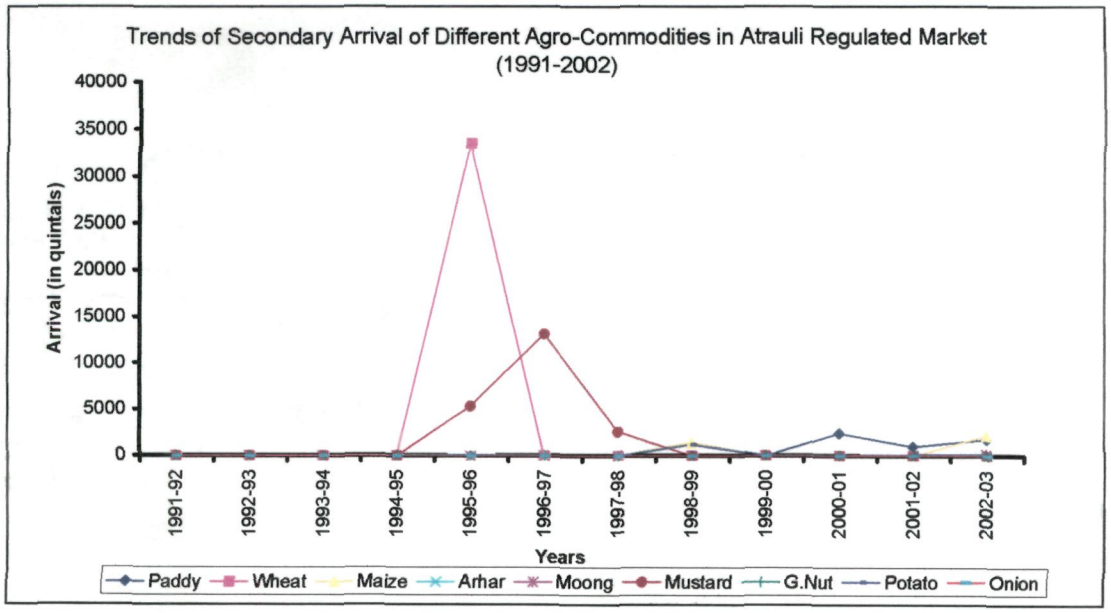

Fig 5.10

Table 5.9: Trends of Primary Arrival of Agro-Commodities in Atrauli Regulated Market (1991-2002)

(In Quintals)

S.No.	Agro-commodities	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
1.	Paddy	-	-	1220	1555	4380	4836	5481	3857	6512	9283	4859	8414
2.	Wheat	4957	4572	8512	10102	12004	10494	41244	111346	55672	69357	67270	65079
3.	Maize	648	454	750	800	10234	13135	17638	8265	31126	30267	20110	6292
4.	Arhar	2	4	60	1120	3110	2836	1368	475	6144	5244	7735	8383
5.	Moong	-	1	8	10	245	659	545	53	80	140	46	823
6.	Mustard	366	285	835	1052	1935	2541	3368	697	550	690	2941	864
7.	G.Nut	4	-	10	2	6	5	5	5	3	7	7	-
8	Potato	6260	4550	6650	8012	9053	6704	7973	4759	6268	9191	9524	15521
9	Onion	110	281	298	470	633	743	980	553	920	1125	720	979

Source: *Respective market place (Aligarh)*

Table 5.10: Trends of Secondary Arrival of Agro-Commodities in Atrauli Regulated Market (1991-2002)

(In Quintals)

S.No.	Agro-commodities	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
1.	Paddy	-	-	-	-	-	-	-	-	-	2430	1010	1784
2.	Wheat	-	-	-	-	33542	-	-	-	-	-	-	-
3.	Maize	-	-	-	-	-	-	-	1461	-	-	-	2201
4.	Arhar	-	-	-	-	-	-	-	-	-	-	60	-
5.	Moong	-	-	-	-	-	-	-	-	-	-	-	206
6.	Mustard	-	-	-	-	5374	13178	2617	-	-	-	-	-
7.	G.Nut	-	-	-	-	-	-	-	-	-	-	-	-
8	Potato	-	-	-	-	106	-	-	1220	60	50	150	147
9	Onion	-	-	-	-	-	-	-	-	-	-	40	-

Source: *Respective market place (Aligarh)*

During study period wheat market arrival grew more than 1200 per cent, while maize registered 87 per cent in its market arrival. The highest arrival of potato and onion was 15,521 and 110 quintals respectively in the respective year of 2002-2003 and 2000-2001. They have also registered positive growth of 147 and 79 per cent in market arrival, while the lowest market arrival of both the commodities was 4,550 quintals and 110 quintals in 1992-93 and 1991-92 respectively.

Arhar and mustard are also coming to this market but in small quantity. The highest primary arrival of *arhar* and mustard was 8,383 and 3,368 quintals in 2002-2003 and in 1997-98, and the lowest market arrival was 2 and 285 quintals in 1991-92 and in 1992-93 in Atrauli regulated market. The arrival of *moong* and groundnut was much below in comparison to other commodities which show the subsistence nature of these crops grown in the study area (Table 5.9 and fig 5.9). Table and figure 5.10 explains that the secondary market arrival of all the commodities in this market does not follow any pattern.

5.4.4 Trends of Agro-Commodities Arrival in Chharra Regulated Market

Chharra is the second largest market in terms of primary arrival of agricultural commodities. "Generally, all the markets have complex commodity arrival, but when a market is specialized for a particular commodity or a set of commodities, it attracts larger number of buyers and sellers from widespread areas in comparison to other markets having common commodity arrival."[1]

It becomes clear from the Table 5.11 and Figure 5.11 that primary arrival of food grains especially wheat and maize is coming to the Chharra market in largest quantity. The highest market arrival of wheat was 377,402 quintals and of maize was 122,213 quintals in 2000-2001 and 1998-99 in Chharra market. The highest arrival of mustard and *arhar* was 77,985 quintals and 44,351 quintals in 1993-94 and 1994-95, while the lowest market arrival was 4,627 quintals mustard in 2000-2001and 930 quintals *arhar* in 1997-98.

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[1] Saxena, H. M (1992), Regulated Agricultural Markets – A Case Study of Rajasthan, Rawat Publications, Jaipur.

Potato, onion and groundnut are coming into this market in lower quantity. Table 5.11 and figure 5.11 clearly explain the behavior of farmers in terms of crop production.

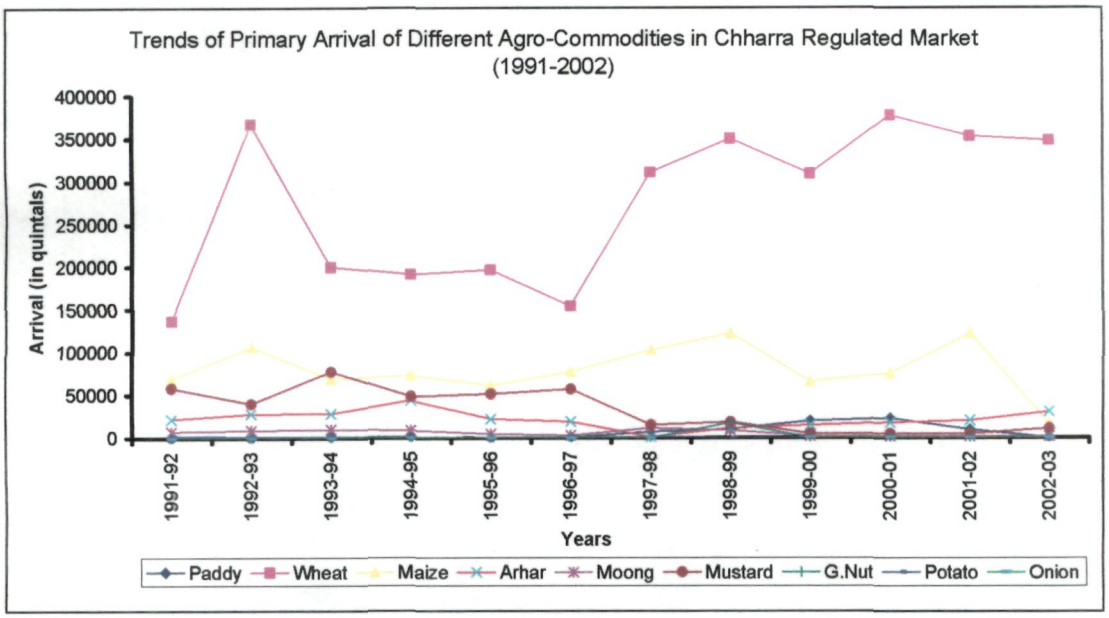

Fig 5.11

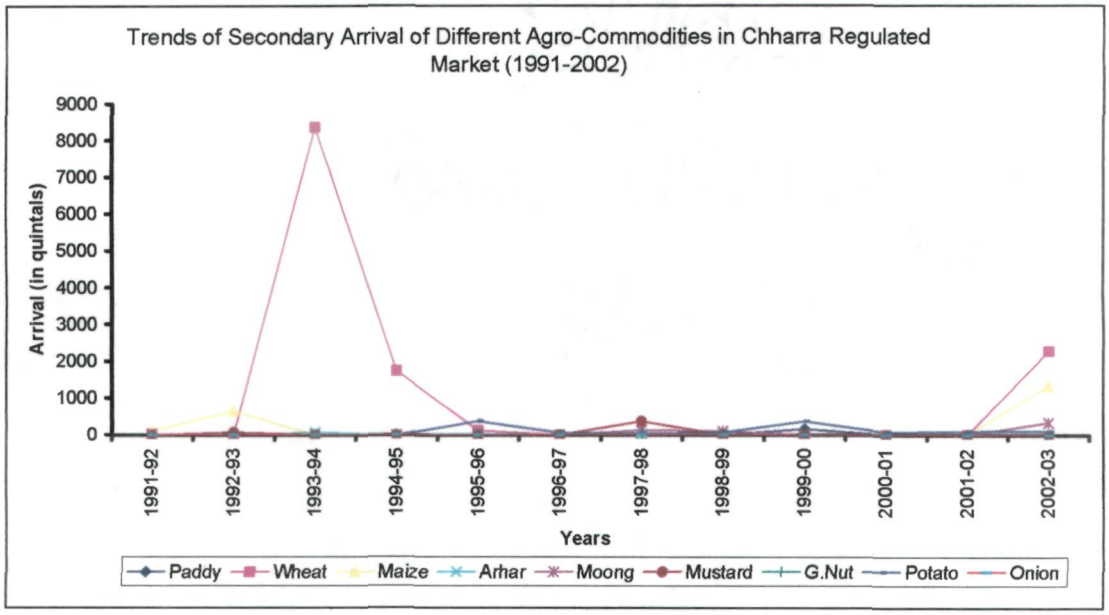

Fig 5.12

Table 5.12 and figure 5.12 show that the highest secondary market arrival of wheat was 8,376 quintals in 1993-94 and the lowest market arrival was 26 quintals in 1991-92. Next to wheat the secondary market arrival was maize in the market for sale. It becomes clear from the Table 5.12 that very insignificant amount of secondary arrival is coming to the Chharra market.

Table 5.11: Trends of Primary Arrival of Agro-Commodities in Chharra Regulated Market (1991-2002)

(In Quintals)

S.No.	Agro-Commodities	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
1.	Paddy	3	8	1625	1301	34	776	7069	10102	19406	22411	9506	315
2.	Wheat	137465	367975	200383	191626	196722	154145	310763	350112	308860	377402	353114	348084
3.	Maize	69595	106419	69618	73629	61822	77415	102689	122213	65884	75610	122102	16248
4.	Arhar	22286	28411	28777	44351	22373	19018	930	11312	14528	17415	20112	30211
5.	Moong	7918	9250	10333	9110	5009	3145	11369	8677	1996	1412	1605	1550
6.	Mustard	58812	40604	77985	48952	51782	57296	14944	18416	4949	4627	4653	10981
7.	G.Nut	-	-	-	-	-	-	-	17254	2	2	4	-
8	Potato	2758	1579	1579	137	467	1090	1223	150	112	426	315	802
9	Onion	140	-	-	-	13	107	30		34	200	30	10

Source: *Respective market place (Aligarh)*

Table 5.12: Trends of Secondary Arrival of Agro-Commodities in Chharra Regulated Market (1991-2002)

(In Quintals)

S.No.	Agro-Commodities	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
1.	Paddy	-	-	-	-	-	-	-	-	158	-	-	-
2.	Wheat	26	-	8376	1751	126	-	-	-	-	-	-	2288
3.	Maize	114	651	-	-	-	-	-	-	-	-	-	1353
4.	Arhar	-	-	64	-	28	-	-	-	-	-	-	-
5.	Moong	-	-	-	-	-	-	130	100	-	-	-	342
6.	Mustard	-	75	-	-	-	-	370	-	-	-	-	-
7.	G.Nut	-	-	-	-	-	-	19	-	-	-	-	-
8	Potato	-	-	-	-	374	60	30	65	369	70	99	105
9	Onion	-	-	-	-	-	-	-	-	-	-	-	-

Source: *Respective market place (Aligarh)*

It was found during the field survey that there were no local purchasers in their villages and no other regulated market over there except Chharra. Therefore farmers were bound to sell their commodities in regulated markets

Analysis shows that foodgrain is one of the important commodities transacted in the markets of Aligarh district, followed by vegetables categories like potato and onion, oilseeds comes in third position of market arrival, while pulses ranks in the last position of market arrival. Market-wise trend shows that Dhanipur has positive trend of market arrival followed by Khair, Chharra and Atrauli. Location has the direct effect on the size and trend of market arrival. Dhanipur has highly positive trend in the market arrival of all the commodities. It is because of the biggest consuming centre i.e., Aligarh city and being well connected with metalled roads with their market hinterland. It has also a well established service area consisting of 274 villages in its jurisdiction as notified area, that is why Dhanipur is having highest market arrival and their trend is positive. Khair is the second most important market as far as market arrivals and their trend is concerned. It is because of big size of landholding and better accessibility around the market hinterland. Chharra and Atrauli come in the third and fourth positions in their market arrival of agro-commodities. These two markets have low market arrival and also their trend in the arrival of agro-commodities is slow. Though the market arrival in these two markets has increased during study period but not very much impressive. On whole it seems that market arrival of agro-commodities has increased many folds but their effect is pronounced specific to commodity and market.

5.5 Seasonal Arrival Pattern of Agro-Commodities

Seasonal arrival patterns are analyzed on the basis of monthly arrival data for the year 2002-2003. The arrival here refers to market arrivals of agro-commodities which are brought into the market by the producer sellers, itinerant traders, village merchants, *katcha arhatiyas* etc. for sale purpose during an agricultural season. In competitive theoretical framework of the marketing

system, arrivals play an important role in determining prices of agro-commodities, as it represents the supply side.[1]

In the analysis of arrivals, the proportion of grains marketed in the immediate post harvest period has frequently been used as an index of the holding power of the farmers on the assumption that higher the holding power of the farmers lower the proportion in the immediate post-harvest sale when the market price is low.[2] An attempt has been made in this section to examine the above assumption with the help of seasonal pattern of market arrivals in the regulated markets of the study area.

Three crop seasons exist in Aligarh district. The *kharif* or autumn crop is sown at the beginning of the rainy season (June –July) and is harvested in autumn (between October and December). The *rabi*, or spring crop is sown in autumn and harvested at the end of cold weather. *Zaid* crops, which are of relatively little importance, occupy the fields from April to July. These crops are synchronized with the winter, rainy and summer season respectively. Wheat, mustard and potato are the major *rabi* crops. Paddy, maize, groundnut and *arhar* are the main kharif crops. Moong crop comes under both *rabi* and *kharif* crops. The sowing period of onion is September and October while the harvesting period is January and February; therefore this crop comes under *rabi* crop.

5.5.1 Seasonal Arrival of Agro-Commodities in Dhanipur Regulated Market

Table 5.13 explains that market arrival of all the agro-commodities directly related with their pre and post harvesting periods. It becomes clear from the table that in Dhanipur regulated market, highest arrival of paddy comes after post harvest period from November to January and is 44.89 per cent, 37.21 par cent and 12.29 per cent respectively. In case of wheat, the post harvest period of high arrivals continue for three months i.e. from April to June which is 8.74 per cent, 35.61 per cent, and 13.54 per cent respectively. But in the months of August and September wheat also comes in good quantity i.e. 15.90 per cent and

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1 .Prasad, J (1989), Marketable Surplus and Market Performance, Mittal Publications, New Delhi, p.139.

2 Lele, J.U (1971), Food grain Marketing in India, Cornell University Press, Ithaca, p.117

15.93 per cent respectively. High arrival of wheat from August to September shows the good holding capacity of farmers in the market area. The arrival of maize, *arhar*, *moong*, mustard and groundnut comes in the market in the month of September-October i.e. 52 per cent and 30.54 per cent for maize, November-December 16.65 per cent, 41.81per cent for arhar, June-July 26.17 per cent, 31.87 per cent for the *moong* crop, March-April 12.44 per cent, 23.15 per cent for mustard, November and January, 53.91 per cent and 53.51 per cent for groundnut. Market arrival of vegetables especially potato and onion comes in the market in highest quantity in the month of April which is 46.28 per cent and 12.26 per cent respectively. But it is clear from the table 5.13 that the primary arrival of potato and onion throughout the year is coming impressively to the market.

Table 5.13 Seasonal Arrival of Agro-Commodities in Dhanipur Regulated Market (2002-2003)

(In Quintals)

Months	Food grains			Pulses		Oilseeds		Vegetables	
	Paddy	Wheat	Maize	Arhar	Moong	Mustard	G.Nut	Potato	Onion
January	12.29	1.63	4.95	20.65	6.00	10.38	53.51	0.08	9.48
February	1.63	0.82	0.85	4.28	1.91	11.91	-	6.86	6.89
March	0.06	1.79	0.16	4.48	3.86	12.44	-	9.10	9.46
April	0.19	8.74	0.90	2.48	4.88	23.15	-	46.28	12.26
May	0.04	35.61	-	1.16	6.48	1.12	-	3.74	8.21
June	0.09	13.54	-	1.33	26.17	4.38	-	2.64	5.37
July	0.17	2.17	0.12	0.20	31.87	6.22	-	4.12	10.12
August	0.01	15.90	3.25	0.14	10.91	2.31	-	3.26	8.71
September	-	15.93	52.0	0.09	3.49	2.09	-	2.01	6.32
October	3.37	2.64	30.54	6.68	1.15	14.04	8.20	5.56	8.23
November	44.89	0.42	3.05	16.65	1.83	7.54	33.91	6.06	9.03
December	37.21	0.75	4.05	41.81	1.38	4.37	4.36	10.22	5.85

Source: Respective market place (Aligarh)

5.5.2 Seasonal Arrival of Agro-Commodities in Khair Regulated Market

Table 5.14 explains that the highest quantity of paddy arrival in the Khair market is recorded during the months of November to March being 9.47 per cent to 17.99 per cent. But usually the post harvest market arrival period for paddy is from November to February. In the case of wheat, it comes in the highest quantity in the months of March to June (10.01 per cent to 16.44 per cent). The highest arrival of maize in the market should be in post harvest period (September to October), but it comes in the month of March to June (10.09 per cent to 10.43 per cent). This type of arrival distorts the theory of post harvest

arrival. The post harvest period of *arhar* is from November to February and the arrival is 6.74 per cent to 15.39 per cent, but usually it comes to market in highest quantity in the month of April to June (16.41 per cent). The market received maximum arrival of mustard in the month of June (20.15 per cent), but the arrival start to increase in the post harvest period from the month of April to the month of June (17 per cent to 20.15 per cent). The highest arrival of potato and onion is found in the month of April and June (17.72 per cent to 19.03 per cent for potato and 10.59 per cent to 12.72 per cent for onion). Post harvest season for potato is generally from April to June but its arrival starts to increase from the month of February to the month of June. Same situation is found for the onion. It explains that the farmers of this region have good holding capacity. They want to sell their commodities in the market when the arrival is low and the market price is high.

Table 5.14 Seasonal Arrival of Agro-Commodities in Khair Regulated Market (2002-2003)

(In Quintals)

Months	Food grains			Pulses		Oilseeds		Vegetables	
	Paddy	Wheat	Maize	Arhar	Moong	Mustard	G.Nut	Potato	Onion
January	17.91	9.57	9.89	14.65	-	4.67	-	6.40	9.11
February	17.99	9.67	9.89	15.39	-	9.25	-	11.74	9.34
March	17.99	10.01	10.09	1.79	-	17.00	-	15.30	9.61
April	-	11.05	10.09	16.41	-	19.51	-	17.72	10.59
May	-	13.13	10.43	16.41	-	19.79	-	18.06	11.56
June	17.99	16.44	10.43	16.41	-	20.15	-	19.03	12.72
July	-	0.64	-	-	-	0.34	-	0.41	2.35
August	-	1.70	-	-	-	1.36	-	1.08	5.12
September	-	4.22	9.44	0.08	-	1.46	-	1.31	6.37
October	1.15	6.67	9.89	0.08	-	1.93	-	2.11	70.04
November	9.47	7.81	9.89	6.74	-	1.97	-	2.68	7.59
December	17.48	9.04	9.89	11.99	-	2.51	-	4.08	8.53

Source: Respective market place (Aligarh)

5.5.3 Seasonal Arrival of Agro-Commodities in Atrauli Regulated Market

It becomes clear from the table 5.15 that the market arrival of paddy comes to Atrauli only after post harvest from November to the January (52.83 per cent to 3.77 per cent). The post harvest effect can clearly be seen in terms of arrival of wheat because it started to increase from the month of April to the month of September (9.88 per cent to 17.56 per cent), after that its arrival comes down. It shows that most of the wheat is coming from market hinterland and farmers sell out their surplus soon after its harvesting period. In the case of

maize this market received maximum amount of maize in the months from September to November (22.84 per cent to 26.20 per cent). Most of the arrival of maize is received within three months after their harvest. The lowest arrival of pulses in the market shows that farmers are growing pulses especially *arhar* and moong only for their subsistence needs. Mustard which is an important crop of this region shows lowest arrival in the busiest month of post harvest. Its highest arrival comes in the market in the month of December and January (14.62 per cent to 63.48 per cent). It shows that farmers want to take good prices for their crops and their better holding capacity. The market arrival of potato and onion, which comes in the largest quantity before the period of post harvest shows the mentality of farmers for getting good prices. The continuous arrival of both the commodities also shows the inclination of farmers for growing vegetables.

Table 5.15 Seasonal Arrival of Agro-Commodities in Atrauli Regulated Market (2002-2003)

(In Quintals)

Months	Food grains			Pulses		Oilseeds		Vegetables	
	Paddy	Wheat	Maize	Arhar	Moong	Mustard	G.Nut	Potato	Onion
January	3 77	0 29	5 53	-	46 66	63 48	-	32 62	19 54
February	-	0 06	1 94	2 95	-	2 88	-	8 26	19 77
March	1 79	0 72	7 25	6 08	-	9 95	-	7 31	11 57
April	0 22	9 88	3 25	5 14	-	3 98	-	1 81	6 43
May	-	24 48	0 60	-	-	0 89	-	1 05	8 04
June	-	12 43	-	-	-	1 24	-	2 47	13 02
July	-	11 96	-	1 67	-	1 19	-	4 72	2 52
August	-	19 45	2 14	3 17	-	-	-	6 47	2 83
September	-	17 56	22 84	-	-	-	-	4 20	4 75
October	2 07	0 01	24 01	-	-	0 89	-	1 57	3 06
November	52 83	1 64	26 20	31 06	10	0 84	-	18 89	4 59
December	39 28	1 46	6 19	49 91	43 33	14 62	-	10 57	3 83

Source: Respective market place (Aligarh)

5.5.4 Seasonal Arrival of Agro-Commodities in Chharra Regulated Market

Chharra is the second largest market after Dhanipur in the study area. Nature of arrival in this market reflects not only the seasonal trend but also speaks the nature of its surroundings. Table 5.16 shows that paddy, *moong*, groundnut and onion are coming to the market in negligible quantity, because of its lower production around the hinterland area of the market. In the case of wheat, maize, *arhar* and mustard, the arrival of all these commodities just after post harvest shows the condition of the farmers of this region. The highest arrival of wheat started to come in the market from the month of April to the

month of June (11.53 per cent to 19.80 per cent). In the case of maize the highest arrival is coming to the market in the month of September and October (52.00 per cent and 30.54 per cent). The highest arrival of *arhar* comes in the market just after post harvest, November to December (16.65 per cent to 41.81 per cent). But the arrival of mustard and potato comes in the market in a good quantity before two months of post harvest season i.e. from November to February (7.54 per cent to 11.91 per cent) for mustard, and April and December (46.28 per cent and 10.22 per cent) for potato.

Table 5.16 Seasonal Arrival of Agro-Commodities in Chharra Regulated Market (2002-2003)

(In Quintals)

Months	Food grains			Pulses		Oilseeds		Vegetables	
	Paddy	Wheat	Maize	Arhar	Moong	Mustard	G.Nut	Potato	Onion
January	17 46	1 88	4 95	20 65	6 00	10 38	53 51	0 08	9 48
February	-	1 47	0 85	4 28	1 91	11 91	-	6 86	6 89
March	-	3 11	0 16	4 28	3 86	12 44	-	9 10	9 46
April	-	11 53	0 90	2 48	4 88	23 15	-	46 28	12 26
May	-	30 56	-	1 16	6 48	1 12	-	3 74	8 21
June	-	19 80	-	1 33	26 17	4 38	-	2 64	5 37
July	-	5 67	0 12	0 20	31 87	6 22	-	4 12	10 12
August	-	9 13	3 25	0 14	10 91	2 31	-	3 26	8 71
September	-	7 40	52 00	0 09	3 49	2 09	-	2 01	6 32
October	-	6 28	30 54	6 68	1 15	14 04	8 20	5 56	8 23
November	27 61	1 94	3 05	16 65	1 83	7 54	33 91	6 06	9 03
December	54 92	1 17	4 05	41 81	1 38	4 37	4 36	10 22	5 85

Source: *Respective market place (Aligarh)*

The domination of wheat, maize, *arhar* and mustard is nothing but a mere reflection of the lack of irrigation, electricity and other facilities coupled with unsuitability for commercial crops. The market hinterland area is absolutely backward from agricultural point of view and its agriculture is largely dependent upon rain. The flooding of agricultural products in the market, just after the harvesting season, reflects the incapability of the farmers to hold their out put.

The Arrival of different agricultural commodities in the regulated markets of the district depends on the type of produce and the harvesting of the season of crops. The analysis of the data reveals that the post harvest period of all the commodities are supplier of maximum proportion of the arrival due to emerging need of the farmers for the cash to invest in agriculture, to meet their socio-economic obligations and repayment of the credits.

5.6 Spatial Pattern of Marketed Surplus of Agro-Commodities in Regulated Markets

Market-wise analysis for the selected crops shows very much variation in its magnitude, because market arrival reflects the production pattern of that particular market hinterland. The location of market also plays an important role in the arrival of the agro-commodities. Dhanipur market received more than 50 per cent of the total marketed surplus of selected agricultural commodities. For example Chharra has a share of 18.22 per cent (408201 quintals), Khair 11.19 per cent (250786 quintals) and Atrauli 4.75 per cent (106355 quintals) of total marketed surplus of the selected agricultural commodities (Table 5.17 and 5.18).

Table-5.17 Spatial Patterns of Marketed Surplus in Regulated Markets (2002-2003)

(In Quintals)

Regulated Market	Food grains			Pulses		Oilseeds		Vegetables		Total
	Paddy	Wheat	Maize	Arhar	Moong	Mustard	G.Nut	Potato	Onion	
Dhanipur	358720	547667	78712	40651	16087	189626	-	208550	35430	1475443
Khair	-	166231	529	20358	-	37841	-	24991	836	250786
Atrauli	8414	65079	6292	8383	823	864	-	15521	979	106355
Chharra	315	348084	16248	30211	1550	10981	-	802	10	408201
Total	367449	1127061	101781	99603	18460	239312	-	249864	37255	2240785

Source: Respective market place (Aligarh)

Table-5.18 Proportion of Individual Crop in the District's Marketed Surplus in the Regulated Markets (2002-2003)

(In Quintals)

Regulated Market	Food grains			Pulses		Oilseeds		Vegetables		District Average
	Paddy	Wheat	Maize	Arhar	Moong	Mustard	G.Nut	Potato	Onion	
Dhanipur	97 62	48 59	77 33	40 81	87 14	79 23	-	83 46	95 10	65 84
Khair	-	14 74	0 51	20 43	-	15 81	-	10 00	2 24	11 19
Atrauli	2 28	5 77	6 18	8 41	4 45	0 36	-	6 21	2 62	4 75
Chharra	0 08	30 88	15 96	30 33	8 39	4 58	-	0 32	0.02	18 22

Source: Respective market place (Aligarh)

5.6.1 Marketed Surplus of Paddy

The proportion of an individual crop in the district's total marketed surplus also shows variation. As far as paddy is concerned, its marketed surplus varies from one regulated market to another. Dhanipur regulated market has the highest share of marketed surplus of paddy (97.62 per cent or 358720 quintals). It is followed by Atrauli regulated market 2.28 per cent (8414 quintals), then

Chharra regulated market 0.08 per cent (315 quintals) respectively. The arrival of paddy in Khair regulated market is completely absent in 2002-2003 (Table 5.17 and 5.18).

5.6.2 Marketed Surplus of Wheat

Like paddy, wheat has also great spatial variation in terms of marketed surplus in different regulated markets. Wheat is coming in highest quantity i.e., 48.59 per cent (547,667 quintals) in Dhanipur regulated market. Chharra is the second largest market for the arrival of wheat (30.88 per cent, 348,084 quintals). The share of wheat in Khair regulated market is 14.74 per cent (166,231 quintals) and the lowest share of wheat arrival in Atrauli regulated market is 5.77 per cent (65,079 quintals).

5.6.3 Marketed Surplus of Maize

Among the food grains, the highest share of maize is coming to the Dhanipur market is 77.33 per cent (78,712 quintals). In Chharra the arrival of marketed surplus of maize is on the second number 15.96 per cent (16,248 quintals). While the share of Atrauli and Khair for the same crop is on third and fourth place i.e., 6.18 per cent (6,292 quintals) for Atrauli and 0.51 per cent (529 quintals) for Khair regulated market (Table 5.17 and 5.18).

5.6.4 Marketed Surplus of Pulses

Among the pulses, the production of *arhar* and *moong* is going on abundantly in the study area. There is a great market-wise variation in the marketed surplus of pulses especially of *arhar* and *moong*. Dhanipur regulated market contributes 40.81 and 87.14 per cent (40,651, 16,087 quintals) *arhar* and *moong* while Chharra contribute 30.33 and 8.39 per cent (30,211 and 1,550 quintals) *arhar* and *moong* respectively. The market arrival of *arhar* comes on third place in Khair regulated market (20.43 per cent or 20,358 quintals) and on fourth number in Atrauli regulated market (8.41 per cent or 8,383 quintals). While the market arrival of moong comes on third place in Atrauli (4.45 per cent or 823 quintals) and no market arrival of moong is found in the Khair regulated market (Tables 5.17 and 5.18).

5.6.5 Marketed Surplus of Oilseeds

Marketed surplus of oilseeds especially mustard in Dhanipur regulated market ranks first (79.23 per cent or 189,626 quintals). It is followed by Khair 15.81 per cent (37,841 quintals), Chharra 4.58 per cent (10,981 quintals) and Atrauli 0.36 per cent (864 quintals) respectively. While there is no arrival of groundnut in any regulated market in 2002-2003. This data clearly shows that mustard is widely grown crop of Aligarh district (Tables 5.17 and 5.18).

5.6.6 Marketed Surplus of Vegetables

The share of vegetables, i.e., potato and onion in the marketed surplus of agricultural commodities also varies among all the regulated markets. Dhanipur constitute 83.46 per cent (208,550 quintals) and 95.10 per cent (35,430 quintals) of total marketed surplus of potato and onion. The proportion of potato is, on second place in Khair with 10 per cent (24,991 quintals) and onion in Atrauli 2.62 per cent (979 quintals). The third largest arrival of potato is in Atrauli market i.e., 6.21 per cent (15,521 quintals) while onion is coming to the Khair regulated market with 2.24 per cent (836 quintals). While both the vegetables are coming to the Chharra market are less than one per cent (Table5.17 and 5.18).

Table-5.19 Proportion of Marketed Surplus of Different Crops at the Individual Market (2002-2003)

(In Quintals)

Regulated Market	Food grains			Pulses		Oilseeds		Vegetables	
	Paddy	Wheat	Maize	Arhar	Moong	Mustard	G.Nut	Potato	Onion
Dhanipur	24.31	37.11	5.33	2.75	1.09	12.85	-	14.13	2.40
Khair	-	66.28	0.21	8.11	-	15.08	-	9.96	0.33
Atrauli	7.91	61.19	5.91	7.88	0.77	0.81	-	14.59	0.92
Chharh	0.07	85.27	3.98	7.40	0.30	2.69	-	0.19	0
Total	8.07	62.46	3.85	6.53	0.54	7.85	-	9.71	0.91

Source: Respective market place (Aligarh)

It becomes clear from the Table 5.19 that spatial pattern of marketed surplus of selected crops in the regulated market shows that wheat accounts for highest share of 62.46 per cent of total marketed surplus of selected crops. It is followed by potato with 9.71 per cent, paddy 8.07 per cent, mustard 7.85 per cent, *arhar* 6.53 per cent, maize 3.85 per cent, onion 0.91 per cent and moong 0.54 per cent respectively in marketed surplus of the district. The difference in

the marketed surplus of selected crops in the district is due to the difference in demand and supply of these selected commodities of the region.

Analysis shows that the market centers which are well connected with roads have a higher proportion of marketed surplus. Dhanipur, Khair and Atrauli are the markets which are coming under this category. Low proportion of marketed surplus of vegetables in Chharra is because of its location in the interior portion of the eastern part of the district.

Moreover, spatially the market centers which are located in the central and western part of the district have higher marketed surplus of agricultural commodities than the market centers located in the eastern part of the district. It is because of well connectivity, big size of land holdings of the farmers, good irrigation facility and higher productivity in these regions. On the other hand lower productivity in the eastern part is due to the small size of landholdings, problem of electricity and irrigation as well as lesser spatial connectivity among the market hinterland. This supports the hypothesis that better spatial integration of market centers at different levels of marketing channels due to efficient transportation and other infrastructural facilities reduces spatial unevenness of marketed surplus.

References

Abbot, J.C (1958), Marketing Problems and Improvement Programmes, FAO Marketing Guide No.1, Food and Agricultural Organization, United Nations.

Arya, A (1993), Agricultural Marketing in Gujarat, Concept Publishing Company, New Delhi.

Ibrahim, R (1984), Market Centers and Regional Development-A Case Study of Delhi-Jaipur-Agra Triangle, B. R. Publishing Corporation, Delhi, p.78

Joshi, B. D, Working of Regulated Markets in India, Vol.2, Market Series No.175, Nagpur, Department of Agriculture, Government of India.

Lele, J.U (1971), Food grain Marketing in India, Cornell University Press, Ithaca, p.117

Narasimha, M.G (1988), Regulated Market in a Rural Economy, Ajanta Publications, New Delhi, p.90.

Prasad, J (1989), Marketable Surplus and Market Performance, Mittal Publications, New Delhi, p.139.

Saxena, H. M (1992), Regulated Agricultural Markets-A Case Study of Rajasthan, Rawat Publications, New Delhi, p.84

CHAPTER-6

MARKET ARRIVAL INTENSITY AND ITS RELATION TO MARKET HINTERLAND

6.1 Introduction

Regulated markets are one of the important institutions in contemporary agro-marketing. These regulated markets not only provide marketing facilities to the farmers but also had a very close relation with their notified area. These market centers are playing very important role in decision making of the farmers to cultivate different kind of crops in their market hinterland on the one hand and maintaining a link between market and its' hinterland. Dependency on the markets to sell agro-commodities is determined by the distance from the villages to the markets and the categories of the farmers. Other factors like access and mode of transport also influence the farmer's decision to sell their commodities in these market centres. Therefore, theoretically the zone of maximum arrival intensity as well as proportion of market arrival should occupy nearest position to the market centre and varies inversely with the distance.

Moreover, the farmers who have fields near the market will pay less transport expenses than one who is at some far distance. The difference in the saving transport costs per acre will be the economic rent. Economic rent decreases as the distance from the market increases[1]. It is thus obvious that farmers of small size of landholding will not come to the market from far distances. Thus results small size of the farmers frequently will come to the market from nearby areas. Because, these market centres are playing very important role in the marketing of agro-commodities and the direct beneficiaries of these markets are their hinterland farmers. Therefore (regulated market) would be considered as one of the most important indicator for the development of agrarian economy. Thus, there is need to evaluate the role of regulated markets with reference to their hinterland. Keeping in view, the importance of regulated markets in agricultural marketing process of the study area the following objectives have been taken.

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1 Shafi, M (1982), Location of Agricultural Activity: Von Thunen Model, The Geographer, Vol XXIX, No. 1, pp.14-24

1. To estimate the market arrival intensity of different agricultural commodities in the regulated markets.
2. To asses the proportion of marketed surplus of different agro-commodities from the different zones to the market.
3. To estimate the number of producer sellers coming from different zones according to the size of land holdings in different regulated markets.

The following hypotheses are to be tested in the present study to understand the above said objectives:

1 Highest market arrival intensity zone and proportion of marketed surplus of agro-commodities are the closest to the market centres. It is inversely related with the distance from the market.

2 The number of sellers and frequency of their visit to market decreases as the distances increases from the market centres.

In order to test the above hypothesis, Von Thunen model of rings (Zone around the mandi) have been applied. Total ten kilometers circle demarcated from regulated market and further it is sub-divided into five concentric zones with two kilometers apart from each other. Three villages from each concentric zone have been selected for detailed enquiry on the basis of random stratified sampling technique. Total fifty households from each sampled villages have been selected on the basis of stratified random sampling technique. They have been thoroughly interviewed regarding various aspects of regulated market and its role in the transaction of agricultural commodities. Market arrival intensity has been calculated by dividing the total quantity of the marketed surplus of a crop by the number of villages in that distance zone.

6.2 Market Arrival Intensity of Agro-Commodities

The intensity of market arrival determines the inter-relationship of market hinterland tested by Neal *et.al* (1975)[1] and Ibrahim (1984)[2]. Generally markets have circular-shaped hinterlands comparable to notified hinterland and zone of maximum intensity should occupy nearest position to the market.

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1 Neal W.L, Mavi. H.S. and Singh J.P (1975) "Kurali Market: A Report on the Economic Geography of Marketing in North Punjab" Economic Development and Cultural Change, Vol. 13, No.2, pp. 129-168.

2 Ibrahim, R.(1984), Market Centers and Regional Development, B.R Publishing Corporation, pp 184-242.

6.2.1 Market Arrival Intensity of Paddy

The data of paddy marketable surplus intensity in regulated markets of Dhanipur and Khair shows that the intensity of arrival is fluctuating with increasing distance. The villages located in the inner most zone of up to 2 kilometres radius from the Dhanipur and Khair markets contributes 66.65 and 42.8 quintals of paddy per village respectively. Whereas the next outer zone of 2.1-4 kilometres adds another 40 and 50 quintals of paddy per village around Dhanipur and Khair regulated markets. Thus all the villages located in the radius of 6 kilometres contribute 75 and 23.08 quintals of paddy per village to both the regulated markets respectively. Whereas the next two outer zones together accounts for 99 and 39.27 quintals of paddy per village around Dhanipur and Khair markets respectively. Intensity of paddy per village does not decline consistently with the increasing distance from both Dhanipur and Khair regulated markets. It is interesting to note that in Dhanipur, the highest intensity arrival per village is from those villages which are located at the distance of 4.1-6 kilometres. While in Khair the highest intensity arrival per village is from 2.1-4 kilometres from the market centre. It is attributed to the high levelsof transport network connectivity and accessibility of traders with the market, better economic conditions of the farmers and big size of surplus to counter the transport and time cost and efficient market information system.

Contrary to this, two other regulated markets in the district showsthe inverse relationship between the distance and intensity of market arrival from their nearby areas. In case of Atrauli and Chharra regulated market the inner most zone of upto 2 kilometres radius contributes highest paddy arrivals of 28.05 and 66.5 quintals per village respectively. Market arrival intensity from second zone of (2.1 to 4 kilometres) is 19.02 quintals for Atrauli and 17.60 quintals for Chharra market per village, while from third distant zone, market arrival intensity is 10.65 and 20 quintals per village around the market of Atrauli and Chharra respectively.

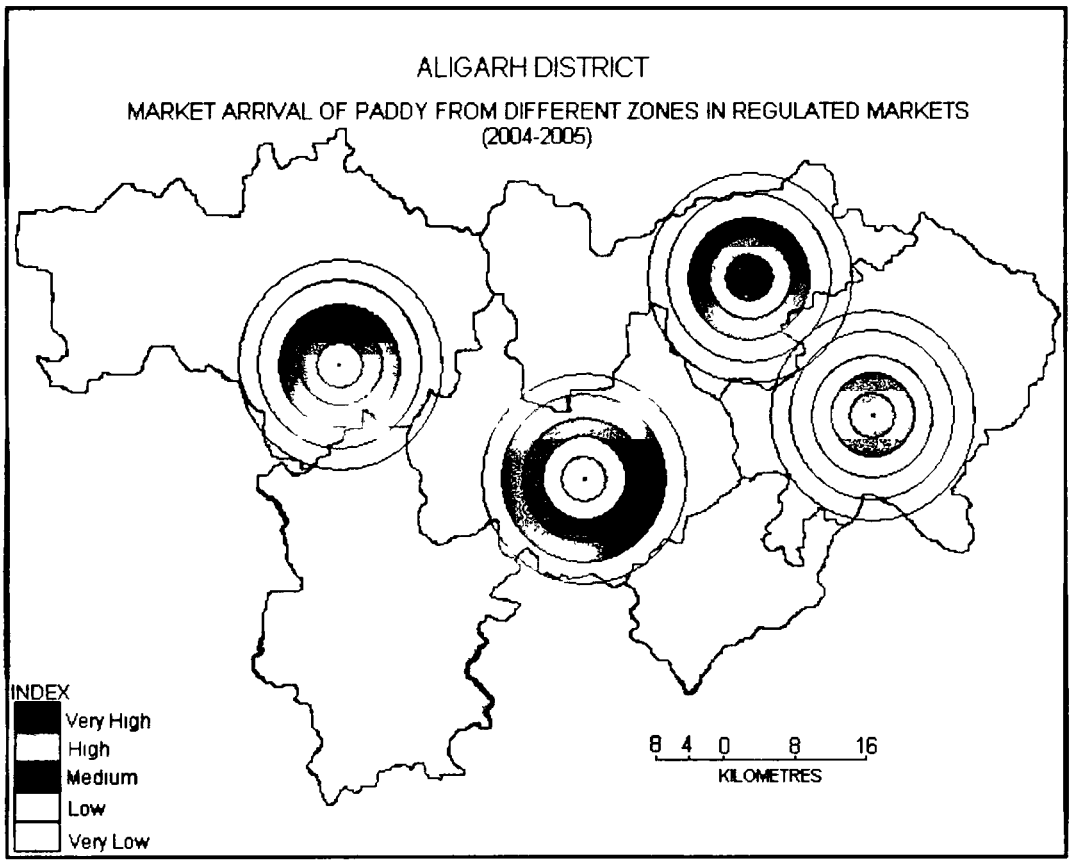
ALIGARH DISTRICT
MARKET ARRIVAL OF PADDY FROM DIFFERENT ZONES IN REGULATED MARKETS
(2004-2005)
INDEX
Very High
High
Medium
Low
Very Low
8 4 0 8 16
KILOMETRES

Fig 6.1

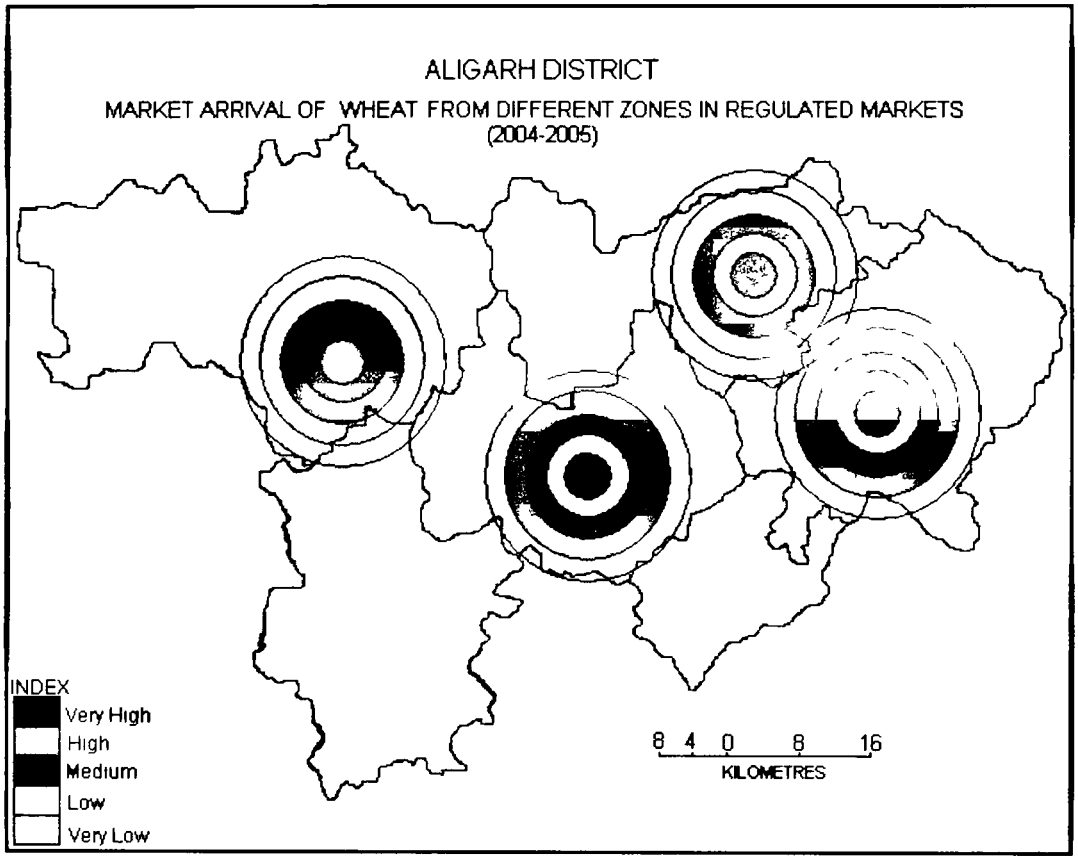
ALIGARH DISTRICT
MARKET ARRIVAL OF WHEAT FROM DIFFERENT ZONES IN REGULATED MARKETS
(2004-2005)
INDEX
Very High
High
Medium
Low
Very Low
8 4 0 8 16
KILOMETRES

Fig 6.2

The lowest arrival intensity per village is contributed by the outer most zone of above 8 kilometres i.e. 4.09 quintals for Atrauli market and 7.45 quintals for Chharra regulated market per village. As the distance from the market center increases the size of arrival is going down (Table and Fig 6.1).

Table 6.1 Market Arrival Intensity of Paddy from Different Zones in Regulated Markets

Distance from Regulated Markets in (Km)	Regulated Markets			
	Dhanipur	Khair	Atrauli	Chharra
Upto-2	66.65	42.8	28.05	66.65
2.1-4	40	50	19.02	17.60
4.1-6	75	23.08	10.65	20
6.1-8	55.55	18.07	7.03	11.55
Above 8	43.45	21.2	4.09	7.45

Source-Field Survey-2004-2005 *(Unit in Quintals)*

6.2.2 Market Arrival Intensity of Wheat

Wheat is the most important and widely growing crop of Aligarh district. It becomes clear from the table 6.2 that wheat is coming in good ratio to Dhanipur, Chharra and Khair regulated markets. The intensity of wheat has shown rather reverse trend. As we go away from the market, the intensity of arrival is increasing. The highest intensity of wheat is coming from third distance zone of 4.1-6 kilometres to Dhanipur regulated market and inner most zones of upto 2 kilometres to Chharra regulated market and second inner most zone of 2.1-4 kilometres in Khair regulated market. The second zone of 2.1-4 kilometres contributed lowest market arrival intensity of wheat i.e., only 43.30 quintals to Dhanipur regulated market and 26.45 quintals to Chharra regulated market per village. While in Khair regulated market the lowest market arrival intensity i.e. 17.15 quintals is coming from the second outer most zone (6.1-8 kilometres). The intensity of wheat arrival to the Chharra market is slightly different from other markets. In Atrauli regulated market the inner most zone contributed highest market arrival intensity of 50 quintals and minimum of 4.60 quintals is contributed by the outer most zone per village. The arrival of wheat to Atrauli market decreases as we go away from the market (Table and Fig 6.2). Small size of land holdings (marginal and small) small quantity of marketable surplus and bad road linkages are the main attributes which

discouraged the arrival of wheat marketable surplus in Atrauli market with reference to increasing distance from it.

Table 6.2 Market Arrival Intensity of Wheat from Different Zones in Regulated Markets

Distance from Regulated Markets in (Km)	Regulated Markets			
	Dhanipur	Khair	Atrauli	Chharra
Upto-2	58.30	28.55	50	100
2.1-4	43.30	50	19.20	26.45
4.1-6	87.50	23.80	15.35	50
6.1-8	83	17.15	8.50	57
Above 8	54.30	18.15	4.60	44.85

Source-Field Survey-2004-2005 *(Unit in Quintals)*

6.2.3 Market Arrival Intensity of Maize

Maize is another important food crop of the study area. Table 6.3 explains that the intensity of maize in all the regulated markets is in same manner. The villages which are located around each regulated market in a circle of 2 kilometres contributed highest intensity of maize i.e. 33.30, 17, and 22 quintals to Dhanipur, Atrauli and Chharra market per village respectively. While in Khair market the highest arrival comes from 2.1-4 kilometres distance (24 quintals). Whereas the next outer zone of 2.1-4 kilometres adds another 16.65, 24, 12.2, 17.6 quintals market arrival intensity per village to Dhanipur, Khair, Atrauli and Chharra markets respectively. The third zone (4.1-6 kilometres) market arrival intensity per village again rises to 17.50 quintals to Dhanipur market. While it (market arrival intensity per village) declines to 11.20 quintals, 6.50 quintals and 10 quintals to Khair, Atrauli and Chharra market respectively.

Table 6.3 Market Arrival Intensity of Maize from Different Zones in Regulated Markets

Distance from Regulated Markets in (Kms)	Regulated Markets			
	Dhanipur	Khair	Atrauli	Chharra
Upto-2	33.30	20	17	22
2.1-4	16.65	24	12.2	17.6
4.1-6	17.50	11.20	6.50	10
6.1-8	12.45	8.40	6	6
Above 8	10.15	6.5	5	4

Source-Field Survey-2004-2005 *(Unit in Quintals)*

The outer most zones of all the regulated markets contributed the lowest 10.15, 6.5, 5 and 4 quintals market arrival intensity per village of maize to all the

regulated markets of Dhanipur, Khair, Atrauli and Chharra respectively. The market arrival intensity of maize decreases in all the regulated markets with the increasing distance because generally this crop gives low returns to the farmers, therefore, it will be uneconomical to travel long distance to sell this crop in the regulated market.

6.2.4 Market Arrival Intensity of Arhar

The crop of *arhar* is widely grown in Aligarh district. It becomes clear from the Table 6.4 that the villages located in inner most zone of 2 kilometres away from Dhanipur regulated market contributed highest market arrival intensity of *arhar* 8.3 quintals per village. And the lowest market arrival intensity of *arhar* 4.8 quintals per village is contributed from zone V of above 8 kilometres to Dhanipur market.

Table 6.4 Market Arrival Intensity of Arhar from Different Zones in Regulated Markets

Distance from Regulated Markets in (Km)	Regulated Markets			
	Dhanipur	Khair	Atrauli	Chharra
Upto-2	8.3	3.55	1.4	8.3
2.1-4	6.65	5	1.5	2.9
4.1-6	6.25	2.35	1.05	3.75
6.1-8	6.25	2.3	1	4.8
Above 8	4.8	2.7	0.6	3.8

Source-Field Survey-2004-2005 *(Unit in Quintals)*

Therefore, as the distance from Dhanipur market increasing, the intensity of arrival is decreasing. The village located 2.1-4 kilometres away from Khair and Atrauli regulated market contributed highest market arrival intensity of *arhar* i.e. 5 and 1.5 quintals per village to both the markets respectively. But the lowest market arrival intensity of 2.3 quintals per village coming to Khair from 6.1-8 kilometres. While in Atrauli, market arrival intensity of *arhar* coming from the outer most zone (above 8 kilometres) i.e. 0.6 quintal per village. The villages located in the periphery of 2 kilometres from Chharra regulated market contributed 8.3 quintals per village which is the highest market arrival intensity of *arhar*. The second zone of 2.1-4 kilometres from Chharra market contributed the lowest market arrival intensity per village which is 2.9 quintals for *arhar* (Table and Fig 6.4).

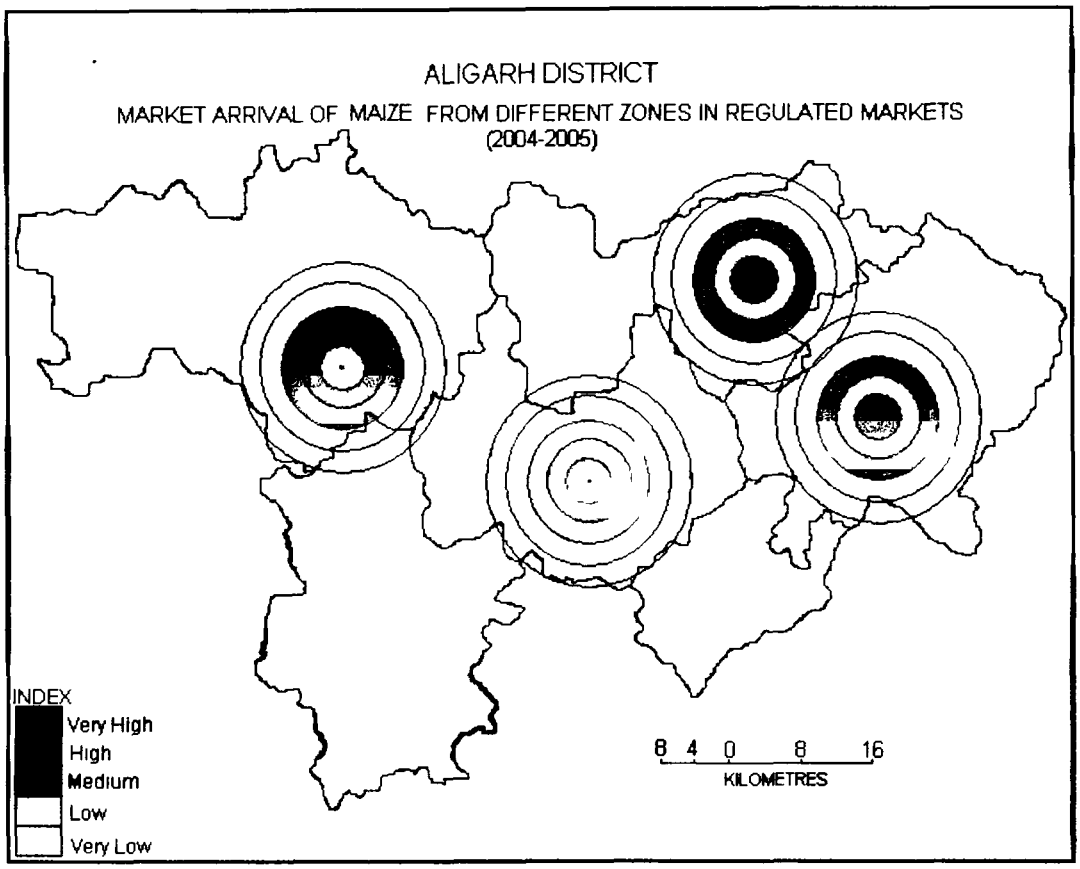
ALIGARH DISTRICT
MARKET ARRIVAL OF MAIZE FROM DIFFERENT ZONES IN REGULATED MARKETS
(2004-2005)
INDEX
Very High
High
Medium
Low
Very Low
8 4 0 8 16
KILOMETRES

Fig 6.3

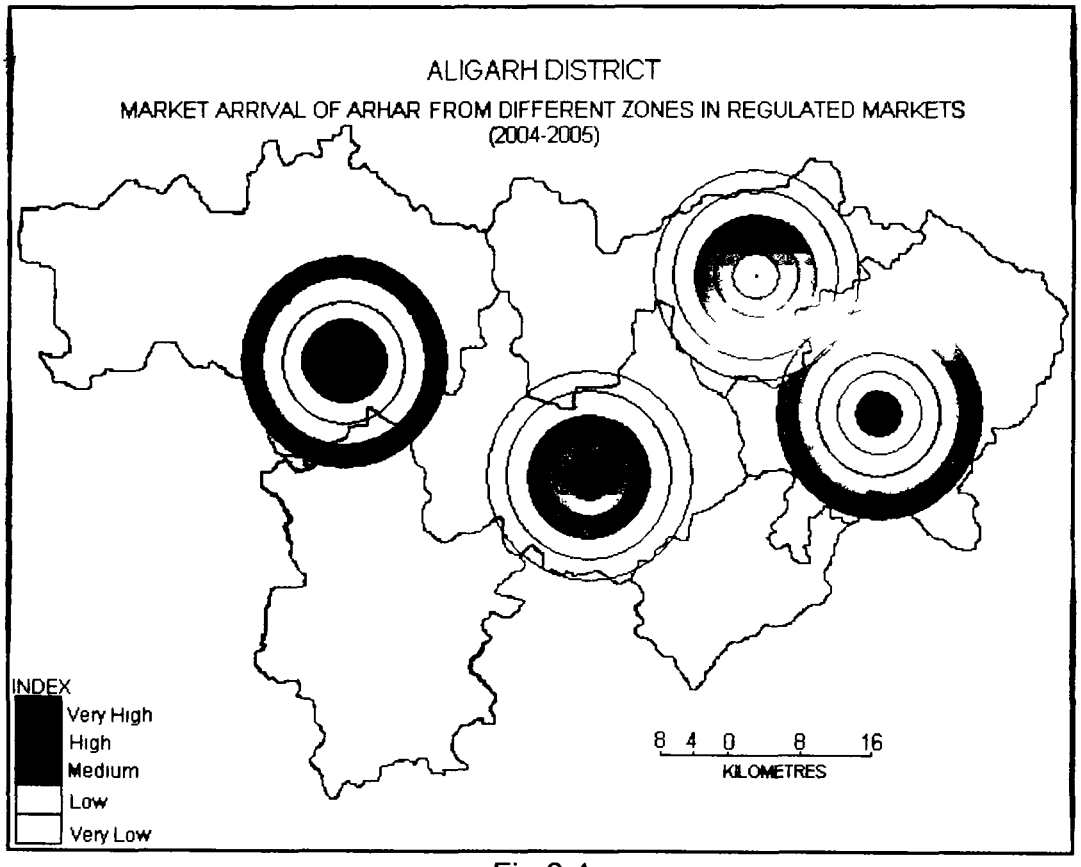
ALIGARH DISTRICT
MARKET ARRIVAL OF ARHAR FROM DIFFERENT ZONES IN REGULATED MARKETS
(2004-2005)
INDEX
Very High
High
Medium
Low
Very Low
8 4 0 8 16
KILOMETRES

Fig 6.4

6.2.5 Market Arrival Intensity of Moong

Moong is the second important crop among the pulses in the study area. In case of moong inner most zone of 2 kilometres radius provides 3.3 quintals of market arrival intensity that is the highest arrival intensity per village to the Dhanipur market. But the villages located in the second, third and fourth distance zone from Dhanipur market posses the same market arrival intensity of 2 quintals per village. Above 8 kilometres away from Dhanipur regulated market, the outer most zones provide the lowest market arrival intensity of 1.6 quintals per villages. The market arrival in Khair regulated market is almost nil in 2004-2005. In the Atrauli regulated market the villages located in the inner most distance zone (upto 2 kilometres) and second outer most distance zone (6.1-8 kilometres) provides almost the same market arrival intensity per village (0.7 and 0.20 quintals) of moong which is the highest arrival intensity. And the lowest market arrival intensity of 0.08 quintals per village has been discovered in the villages located in the outer most zone of above 8 kilometres. The villages located in the inner most distance zone (upto 2 kilometres) provides the highest market arrival intensity of 1.65 quintals of moong in the Chharra market. But as we move from the inner most zone to the outer most zone, the intensity of arrival of moong is decreasing (Table and Fig 6.5).

Table 6.5 Market Arrival Intensity of Moong from Different Zones in Regulated Markets

Distance from Regulated Markets in (Km)	Regulated Markets			
	Dhanipur	Khair	Atrauli	Chharra
Upto-2	3.3	-	0.7	1.65
2.1-4	2	-	0.35	.25
4.1-6	2	-	0.35	.25
6.1-8	2	-	0.20	.40
Above 8	1.6	-	0.08	.10

Source-Field Survey-2004-2005 *(Unit in Quintals)*

6.2.6 Market Arrival Intensity of Mustard

The market arrival intensity of mustard in the villages located in different distance zones around the regulated market of study area can not be generalized. Dhanipur and Khair regulated market had 19.98 and 5.7 quintals market arrival intensity of mustard in the inner most circle of 2 kilomtres. The

market arrival intensity per village declines and became 10.38 quintals in Dhanipur regulated market and increases 9.35 quintals in Khair market in the second inner most distance zone of 2.1-4 kilometres. The third zone of 4.1-6 kilometres, records 21 quintals of market arrival intensity to Dhanipur market and 7.1 quintals of market arrival intensity to Khair market. Fourth zone of 6.1-8 kilometres records 25.53 quintals (highest) market arrival intensity of mustard per village to Dhanipur and 6.25 quintals market arrival intensity per village to Khair market. The lowest (3.90 and 1.5 quintals) market arrival intensity of mustard per village are in the outer most distance zone (above 8 kilometres) of Dhanipur and Khair market. The market arrival intensity of mustard to the Atrauli market is in the same way i.e. from highest market arrival intensity of 4.5 quintals (second inner most distance zone) to the lowest of 0.6 quintals market arrival intensity (outer most distance zone). While in Chharra, the highest market arrival intensity of 13.2 quintals are provided by the villages which are located in the inner most distance zone of upto 2 kilometres. The market arrival intensity declines to 4.6 quintals in the second inner most distance zone, again it raises to 10 quintals in the third zone per village. But it is continuously going down as the distance increases (6.1-8 kilometres) from the Chharra market (Table and Fig 6.6).

Table 6.6 Market Arrival Intensity of Mustard from Different Zones in Regulated Markets

Distance from Regulated Markets in (Km)	Regulated Markets			
	Dhanipur	Khair	Atrauli	Chharra
Upto-2	19.98	5.7	0	13.2
2.1-4	10.38	9.35	4.5	4.6
4.1-6	21	7.1	4.2	10
6.1-8	25.53	6.25	1.5	9.2
Above 8	3.9	1.5	0.6	2

Source-Field Survey-2004-2005 *(Unit in Quintals)*

6.2.7 Market Arrival Intensity of Groundnut

It becomes clear from the Table and fig 6.7 that the Dhanipur regulated market is the only market in which arrival intensity of 6.6 quintals of groundnuts had been received in the inner most distance zone of 2 kilometres radius.

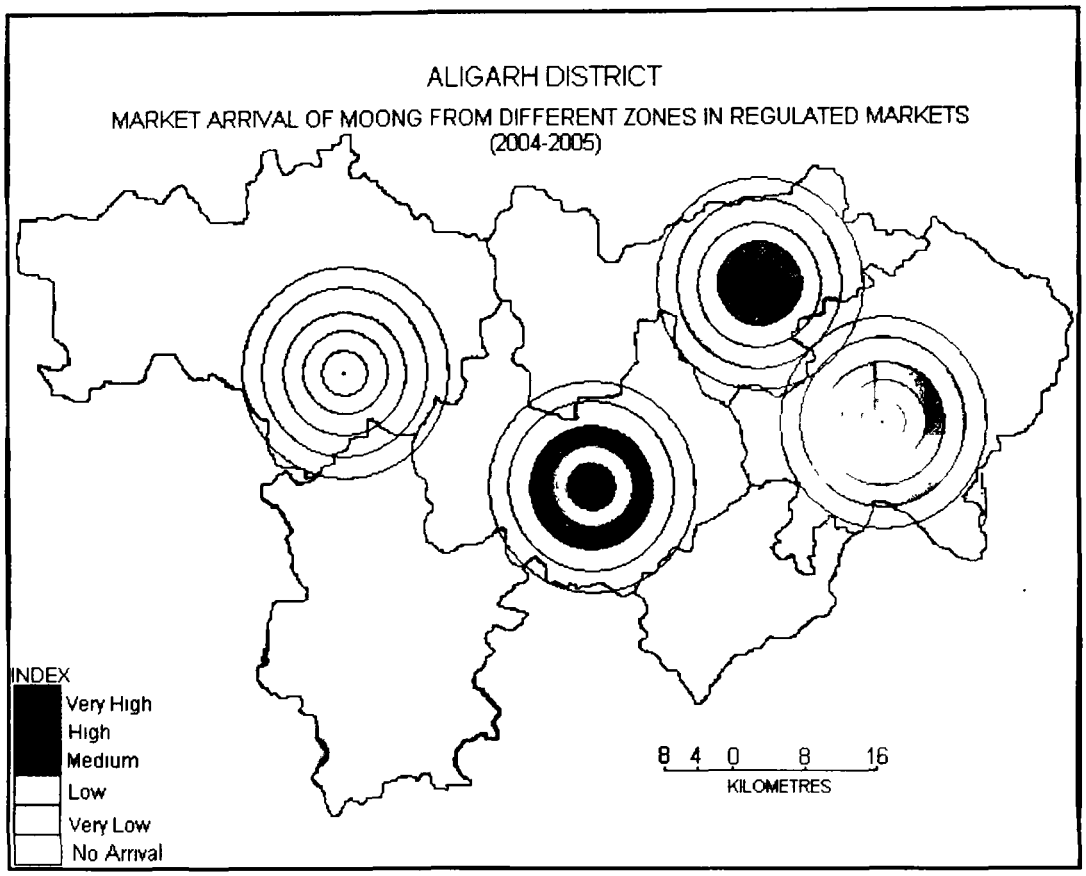
ALIGARH DISTRICT
MARKET ARRIVAL OF MOONG FROM DIFFERENT ZONES IN REGULATED MARKETS
(2004-2005)
INDEX
Very High
High
Medium
Low
Very Low
No Arrival
8 4 0 8 16
KILOMETRES

Fig 6.5

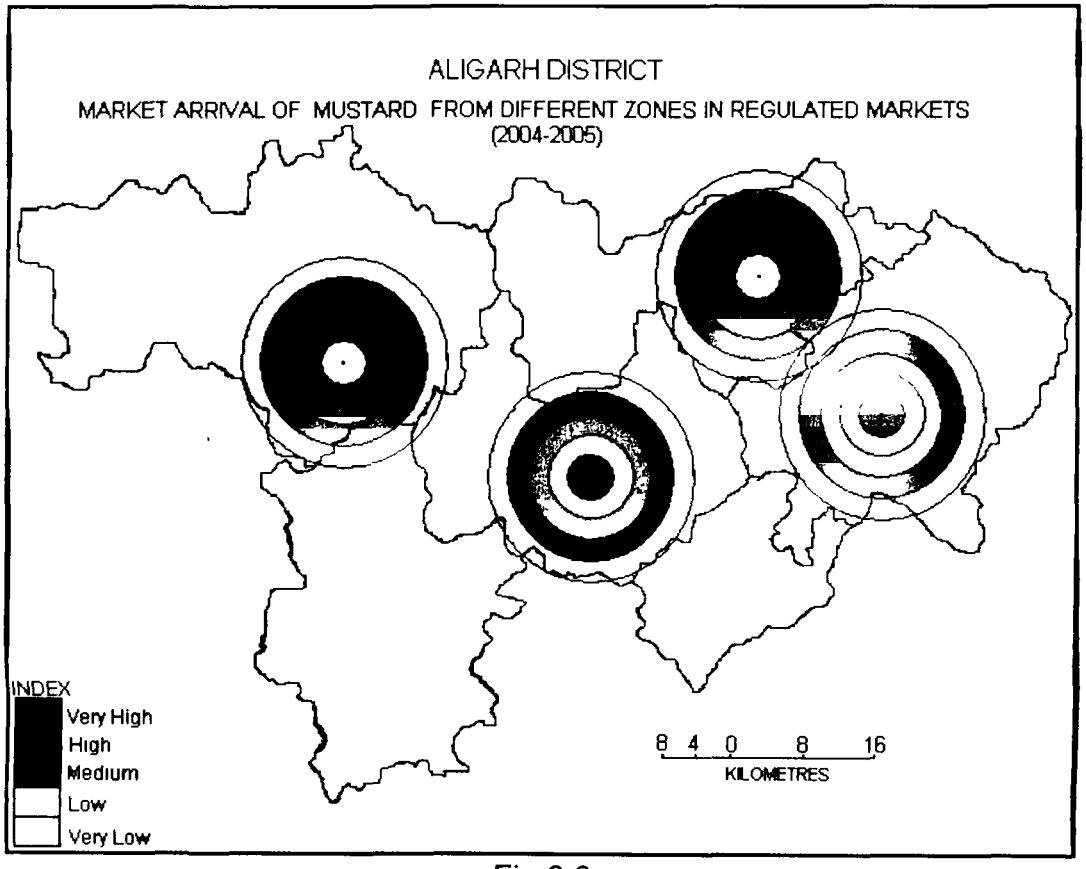
ALIGARH DISTRICT
MARKET ARRIVAL OF MUSTARD FROM DIFFERENT ZONES IN REGULATED MARKETS
(2004-2005)
INDEX
Very High
High
Medium
Low
Very Low
8 4 0 8 16
KILOMETRES

Fig 6.6

The market arrival intensity of groundnuts further declines to 1.3, 1 and 1.4 quintals in the second, third and fourth distance zone to Dhanipur market respectively. But other regulated market namely Khair, Atrauli and Chharra does not receive groundnut, because of low demand in the market.

Table 6.7 Market Arrival Intensity of Groundnut from Different Zones in Regulated Markets

Distance from Regulated Markets in (Km)	Regulated Markets			
	Dhanipur	Khair	Atrauli	Chharra
Upto-2	6.6	-	-	-
2.1-4	1.3	-	-	-
4.1-6	1	-	-	-
6.1-8	1.4	-	-	-
Above 8	0	-	-	-
Total		-	-	-

Source-Field Survey-2004-2005 *(Unit in Quintals)*

6.2.8 Market Arrival Intensity of Potato

The market arrival intensity of potato is quite different for Dhanipur in comparison to other regulated market of Aligarh district. Table 6.8 explains that the villages located far away (6.1-8 kilometres) contribute maximum (46.25 quintals) arrival intensity to the total marketed potato. Third, first and second zone occupy second, third and fourth place respectively to the Dhanipur market. The intensity of potato per village declines above the distance of 8 kilometres from Dhanipur market. The second inner most distance zone (2.1-4 kilometres) of Khair provides the highest 18.7 quintals of market arrival intensity of potato per village. The third, first and fifth zone occupy the second, third and fourth place in terms of arrival intensity of potato per village to the Khair market. The villages located in the second outer most distance zone (6.1-8 kilometres) provide the minimum market arrival intensity of 3.1 quintals per village of potato to the Khair market respectively. The villages located in the inner most distance zone provides the highest market arrival intensity (8.5 quintals) of potato to Atrauli market per village, while the lowest arrival intensity is contributed by the outer most distance zone (above 8 kilometres) which is 2.3 quintals per village to Atrauli market. The third distance zone (4.1-

6 kilometres) provides the highest intensity (5 quintals per village) of potato to the Chharra market (Table and Fig 6.8).

Table 6.8 Market Arrival Intensity of Potato from Different Zones in Regulated Markets

Distance from Regulated Markets in (Km)	Regulated Markets			
	Dhanipur	Khair	Atrauli	Chharra
Upto-2	33.3	11.4	8.5	1.33
2.1-4	20	18.7	6.1	3.4
4.1-6	37.5	11.9	3.5	5
6.1-8	46.25	3.1	3	1.4
Above 8	7.8	3.3	2.3	-

Source-Field Survey-2004-2005 *(Unit in Quintals)*

6.2.9 Market Arrival Intensity of Onion

Table 6.9 explains the market arrival intensity of onion from the villages located in the hinterland of regulated market of Aligarh district. The villages located in the third distance zone (4.1-6 kilometres) provide the maximum market arrival intensity (30 quintals per village) of onion to the Dhanipur market. Second maximum arrival intensity (26.6 quintals per village) is coming from the inner most distance zone (upto 2 kilometres) to Dhanipur market. Fourth and second zones occupy third and fourth place respectively for Dhanipur and outer most distance zone (above 8 kilometres) contribute the lowest market arrival intensity (4.2 quintals per village).

Table 6.9 Market Arrival Intensity of Onion from Different Zones in Regulated Markets

Distance from Regulated Markets in (Km)	Regulated Markets			
	Dhanipur	Khair	Atrauli	Chharra
Upto-2	26.6	5.6	17	6.6
2.1-4	20	7.4	7.6	2.2
4.1-6	30	1.8	2	2
6.1-8	25.8	1.2	1	0.6
Above 8	4.2	0	0	0

Source-Field Survey-2004-2005 *(Unit in Quintals)*

Moreover, in Khair regulated market, the villages located in the distance zone of 2.1-4 kilometres contributed the highest 7.4 quintals market arrival intensity. First, third and fourth zone occupy second, third and fourth place respectively in terms of market arrival intensity of onion to the Khair market.

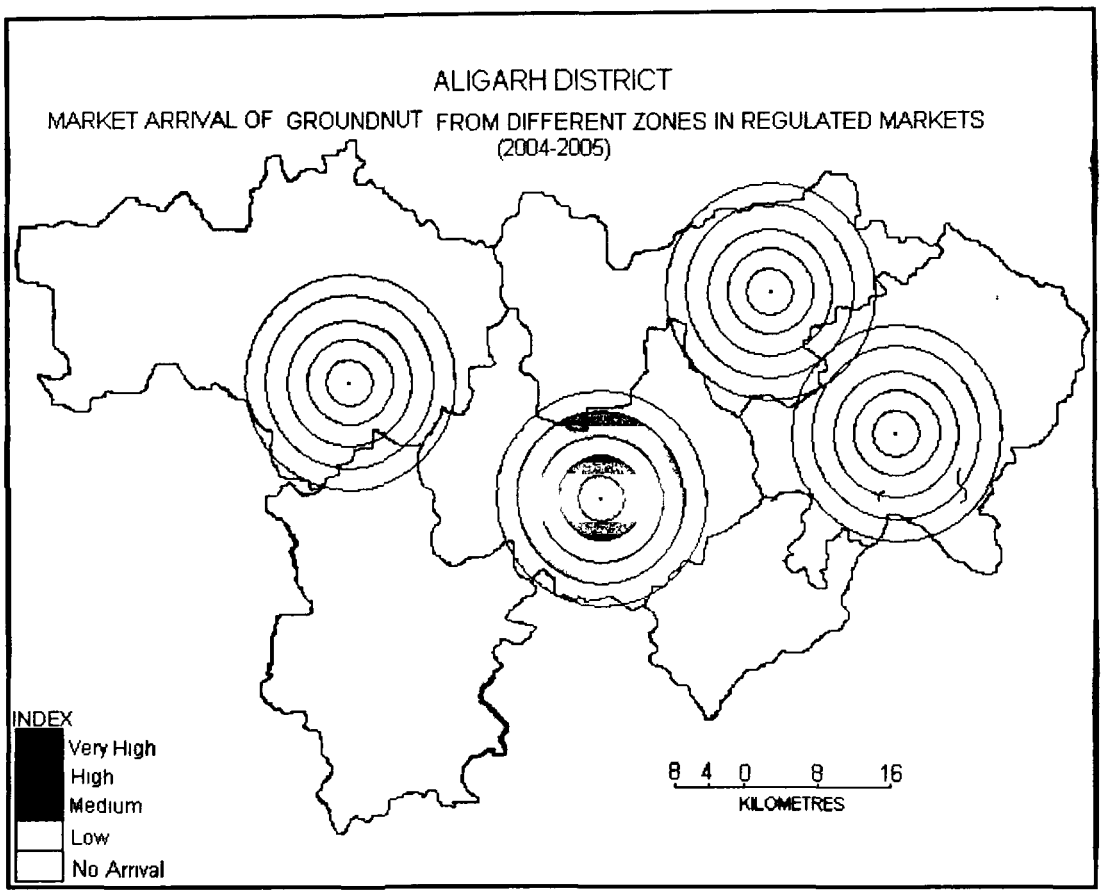
ALIGARH DISTRICT
MARKET ARRIVAL OF GROUNDNUT FROM DIFFERENT ZONES IN REGULATED MARKETS
(2004-2005)
INDEX
Very High
High
Medium
Low
No Arrival
8 4 0 8 16
KILOMETRES

Fig 6.7

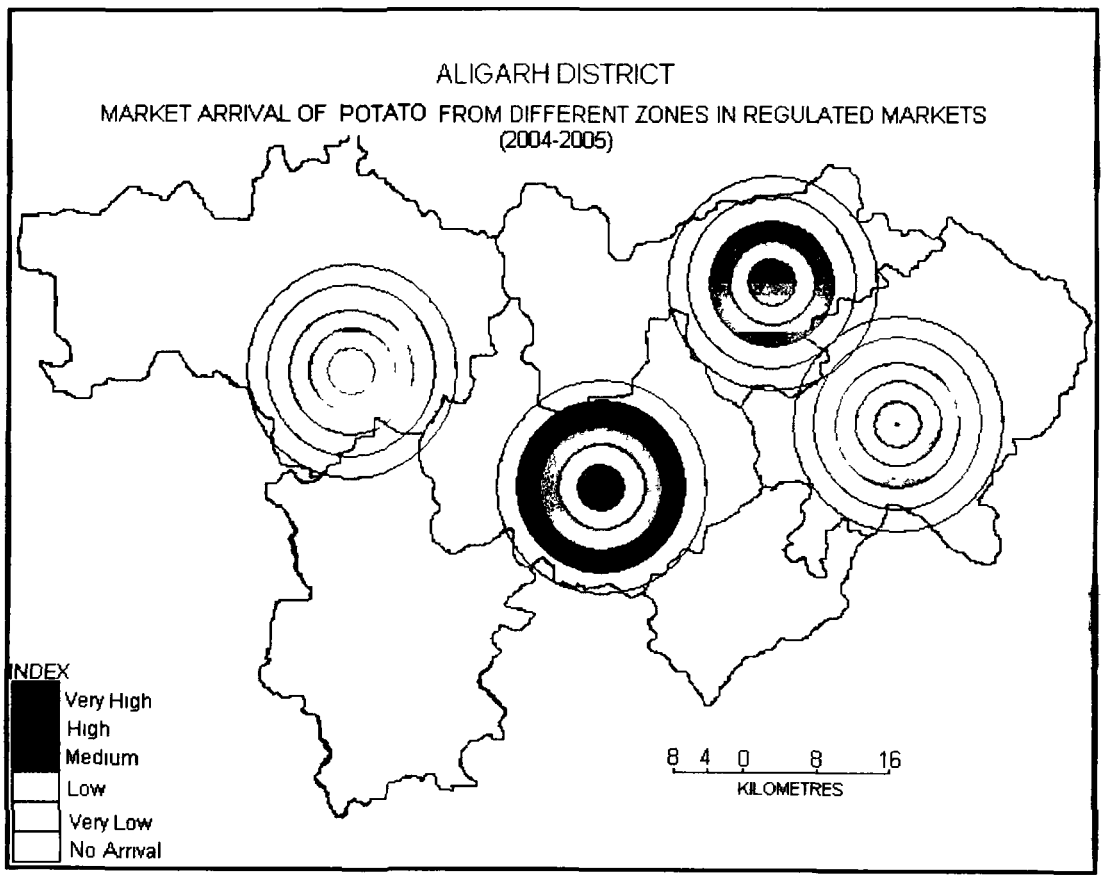
ALIGARH DISTRICT
MARKET ARRIVAL OF POTATO FROM DIFFERENT ZONES IN REGULATED MARKETS
(2004-2005)
INDEX
Very High
High
Medium
Low
Very Low
No Arrival
8 4 0 8 16
KILOMETRES

Fig 6.8

The market intensity of onion from the inner most distance zone to the outer most distance zone, shows the trend from highest market arrival intensity per village to the lowest market arrival intensity per village of Atrauli market. Almost same conditions are prevailing for Chharra market in terms of onion market arrival intensity.

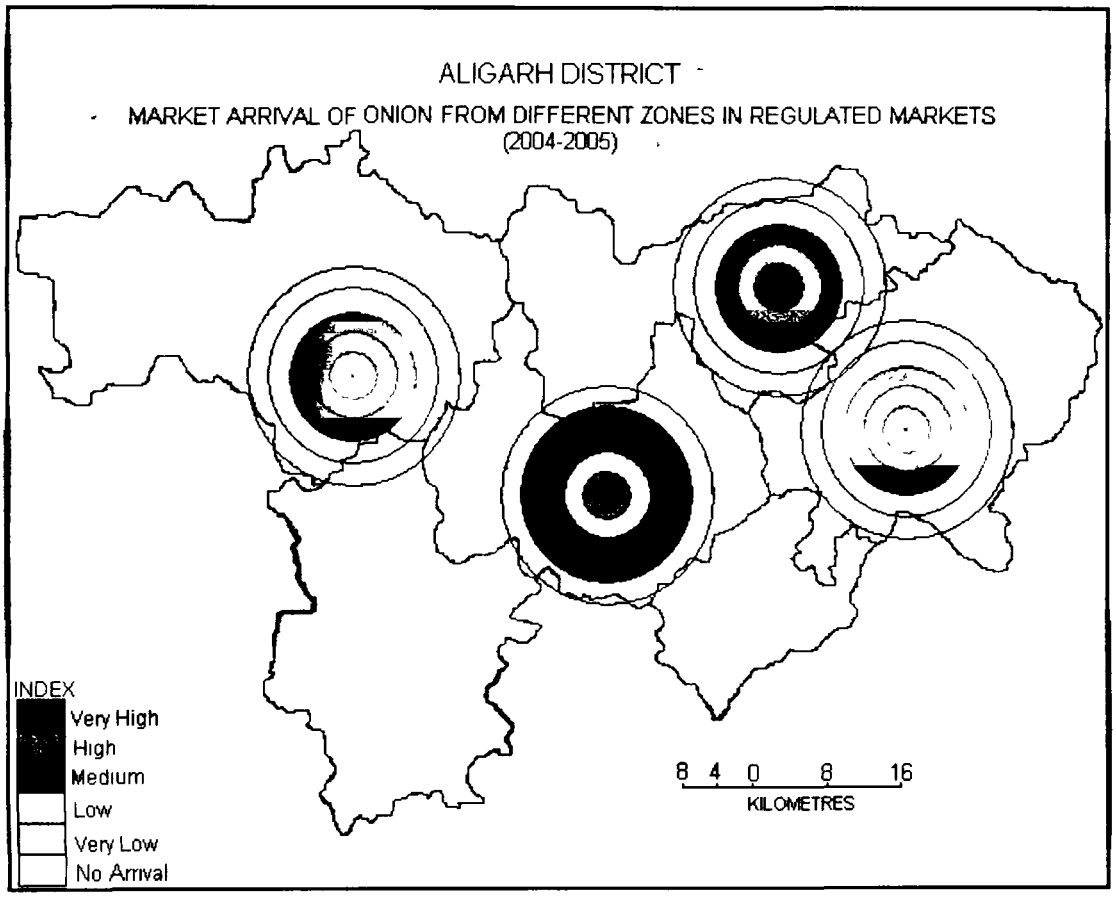

Fig 6.9

Thus it is found from the above analysis that there is close relationship between the distance from the market and intensity of agro-commodities. The spatial distribution and location of the markets is responsible for the distortion of distance decay patterns. The hypothesis that as the distance increases the market arrival intensity declines does not hold true for every crop and market. For paddy market arrival intensity declines with distance in Atrauli and Chharra regulated market but it is not true for Dhanipur and Khair regulated market. Similarly in case of wheat intensity of market arrival increases in Dhanipur and Khair market. While Atrauli and Chharra market registered declining trend in market arrival intensity with distance. Moreover, maize, arhar, groundnut, and moong have also registered declining trend as one move

from the market. Whereas mustard, potato and onion do not have identical market arrival intensity. The assumption that as the distance increases the arrival intensity declines does not hold true in case of wheat, paddy mustard, potato and onion but for maize, arhar and moong it proves true. Thus researcher arrived at conclusion, that in a country where farming is the mainstry of the people. The variations in mandi arrival intensity are related in-direct proportion, other things being equal to variation in distance from market.

6.3 Proportion of Agro-Commodities Arrival

The size of the marketable surplus is one of the important variables that influence the decision of the farmers to sell their commodities in the markets. Therefore, from the nearby villages even smallest surplus quantity of agricultural produce which a farmer wishes to sell can be transported economically with any mode of transportation, where as from the distant villages, it is not economical to bring small produce to the regulated market. Thus as the distance from the market increases it receives less produce from each zone. To understand the proportion of agro-commodities from each zone around market hinterland total quantity of market arrival was taken from each zone around the market.

6.3.1 Proportion of Market Arrival in Dhanipur Market

Dhanipur market is one of the important regulated market of the Aligarh district. The arrival pattern of major agro-commodities at Dhanipur market shows large deviations from the hypothesis that with the increasing distance the arrival size declines from the market hinterland. The villages located in the inner most zones of 2 kilometres of radius from the market centres contributes only 11.95 per cent paddy, 20.59 per cent of wheat, 17.39 per cent of maize, 15.63 per cent of *arhar*, 26.63 per cent of moong, 19.34 per cent of mustard, 30.67 per cent of groundnuts, 14.63 per cent of potato and 19.97 per cent of onion respectively. Whereas next outer zone of 2.1-4 kilometres adds 26.76 per cent of paddy, 25.63 per cent of wheat, 28.41 per cent of maize, 19.44 per cent of arhar, 24.85 per cent of moong, 27.08 per cent of mustard, 25.77 per cent of groundnut, 25.60 per cent of potato and 24.23 per

cent of onion. Thus all the villages located in the radius of 4 kilometres contribute 35 to 55 per cent of total agro-commodities. The arrival of agro-commodities varies from 35 per cent of maize to 50 per cent of groundnut arrival from the radius of 4 kilometres. The area having a radious of six kilometres from the market contributes upto 80 per cent of total arrival in the market. Decreasing proportion of market arrival has been registered from fourth distance zone around the markets. Very sharp decrease in marketed surplus has been registered in fifth distance zone around the market of Dhanipur. Thus it may be concluded from the table 6.10 that the maximum arrival of agro-commodities in the Dhanipur market is not from the inner most zones, rather, it is the second and third distance zone which contributes maximum market arrival. From fourth distance zone proportion of market arrival is being start decreasing outward from the market center.

Table 6.10 Proportion of Marketed Surplus from Different Zones in Dhanipur Market

Distance from Market in (Kms)	Paddy	Wheat	Maize	Arhar	Moong	Mustard	G.Nut	Potato	Onion
Upto-2	11.95	20.59	17.39	15.63	26.63	19.34	30.67	14.63	19.97
2.1-4	26.76	25.63	28.41	19.44	24.85	27.08	25.77	25.60	24.23
4.1-6	25.4	22.88	26.91	32.29	17.75	19.34	24.54	27.07	23.97
6.1-8	19.75	21.28	15.07	17.36	18.34	17.99	19.02	20.40	20.64
Above 8	16.06	9.61	12.17	15.28	12.43	16.25	0.00	12.29	11.99

Source-Field Survey-2004-2005 *(Unit in per cent)*

6.3.2 Proportion of Market Arrival in Khair Market

The proportion of market arrival of two inner most distance zone is almost identical in all crops except potato. Proportion of market arrival decreases as the distance increases is valid and true. Upto 2 kilometers radius from the market contributes 29.26 per cent of paddy, 27.64 per cent of wheat, 23.28 per cent of maize, 27.84 per cent of arhar, 25.5 per cent of mustard, 11.4 per cent of potato and 30.61 per cent of onion. Whereas next distance zone contributes 23.21 per cent of paddy, 23.27 per cent of wheat, 18.85 per cent of

maize, 24.44 per cent of arhar, 24.7 per cent of mustard, 18.7 per cent of potato and 27.11 per cent of onion. Together upto 4 kilometers from the market contributes about 50 per cent of market surplus.

Leaving apart the third concentric zone (4.1-6 kilometers away from the market point), the proportion of agro-commodities has shown declining trend with increasing distance from the market. The proportion declines with distance between third and fourth distance zones is not very high, but it is very much noticeable between fourth and fifth distance zones.

Table 6.11 Proportion of Marketed Surplus from Different Zones in Khair Market

Distance from Market in (Km)	Paddy	Wheat	Maize	Arhar	Moong	Mustard	G.Nut	Potato	Onion
Upto-2	29.26	27.64	23.28	27.84	-	25.5	-	11.4	30.61
2.1-4	23.21	23.27	18.85	24.44	-	24.7	-	18.7	27.11
4.1-6	20.32	21.73	21.29	20.32	-	26	-	11.9	25.85
6.1-8	15.55	18.18	21.06	16.5	-	20.1	-	3.1	16.33
Above 8	11.66	9.18	15.52	10.9	-	3.7	-	3.3	-

Source-Field Survey-2004-2005 *(Unit in per cent)*

6.3.3 Proportion of Market Arrival in Atrauli Market

The arrival pattern in Atrauli market is very close to hypothesis that with increasing distance from the market centre the share of different crops declines in all direction except for mustard in which arrival is almost negligible from first zone and there is no uniformity in arrival from each distance zone as we move from the market. Another marked feature of the market is that beyond the distance of 8 kilometres the share of different crops in marketed surplus declines sharply. Beyond the distance of 8 kilometres no crop except wheat and arhar share more than 10 per cent in market arrival of agro-commodities. Moong arrival in the marketed share declines sharply from 18 per cent in fourth zone to 3.74 per cent in fifth distance zone. In this market maximum proportion of marketed surplus comes from the first zone. Which constitute in between 25 and 30 per cent of total marketed surplus.

Table 6.12 Proportion of Marketed Surplus from Different Zones in Atrauli Market

Distance from Market in (Km)	Paddy	Wheat	Maize	Arhar	Moong	Mustard	G.Nut	Potato	Onion
Upto-2	28.05	26.09	30.4	27.17	32.09	-	-	26.15	29.06
2.1-4	19.02	22.17	26.01	25.1	24.33	33.88	-	25.1	28.33
4.1-6	10.65	20.47	22.01	22.86	21.66	34	-	20.12	26.15
6.1-8	7.03	19.33	14.45	14.85	18.18	22.59	-	19.56	16.46
Above 8	4.09	11.94	7.13	10.02	3.74	6.98	-	9.07	-

Source-Field Survey-2004-2005 *(Unit in per cent)*

6.3.4 Proportion of Market Arrival in Chharra Market

It is one of the important grain markets in the Aligarh district. In this market arrival pattern is very much identical and the share of each different crops like mustard potato, onion and moong decreasing uniformly. Paddy marketed surplus is very much identical and contributes around 28.5 per cent from first zone, 25.15 per cent from second zone. Wheat and maize has similar kind of share in marketed surplus. Arhar proportion in marketed surplus is almost uniform from first and second zones and starts declining from third zone. Mustard and potato registered very sharp declining trend between first and second zone and their share in marketed surplus gradually decreasing from third to fourth zone.

Table 6.13 Proportion of Marketed Surplus from Different Zones in Chharra Market

Distance from Market in (Km)	Paddy	Wheat	Maize	Arhar	Moong	Mustard	G.Nut	Potato	Onion
Upto-2	28.5	26.15	27.06	25.67	28.48	37.1		35.42	29.70
2.1-4	25.15	25.85	24.76	25.37	20.75	23.05		27.33	33.66
4.1-6	20.89	20	22.78	20.01	22.78	20.26		25.1	27.72
6.1-8	15.87	16.62	17.6	17.31	21.97	15.56		12.15	8.91
Above 8	9.59	11.38	7.8	11.64	6.02	4.03		0	-

Source-Field Survey-2004-2005 *(Unit in per cent)*

Onion has rather reverse kind of share in marketed surplus. First zone is having 29.70 per cent, second zone 33.66 per cent, third zone 27.72 per cent while

fourth zone share is 8 per cent in marketed surplus, but it is almost absent in the last zone Chharra market

From the above analysis, it has been discovered that all four regulated markets of the Aligarh district play very important role in the marketing of agro-commodities. Because a large proportion of marketable surplus around the hinterland of the market are comes to these market centres. Proportion of market arrival from different zones in the market generally decreases as we move from the market centres. But it varies market wise and crop-wise. Except Dhanipur all three regulated markets does not have very much ideal conditions for market arrivals from there hinterland. The hypothesis that as the distance increases the proportion of market arrival declines does not hold true in case of Dhanipur market, but true with reference to Khair, Atrauli and Chharra market. This fact supports the hypothesis that if the villages around the market area have better road linkages to the market center, the constraint of distant factor can be subdued.

6.4 Producer Sellers' Participation in the Regulated Markets

Distance does have a direct bearing on the type of farmers interacting with the market (Mishra and Routray, 1995)[1]. Size of landholding and distance from the market are two important factors governing the role of regulated markets. Because farmers having small size of land holding and located near the regulated market would certainly come to the market to sell even small agricultural produce. Contrary to this farmer having large size of landholding can even come to the market from far distances. Therefore, the number of producer sellers and frequency of their visit to market decreases as the distances increases from the market centers.

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[1] Mishra, S and Routray, J.K (1995), Role of Market Towns in the Delhi Metropolitan Region-A Case Study of "Palwal", Haryana, *Asian Profile*, Vol,23, No.4, pp-329-348.

6.4.1 Dhanipur Market

The majority of the farmers coming in this market within a distance of six kilometers belong to small and marginal category. The producer seller's of small size of landholding (4 to 8 acres) were found in large number in three consecutive distance ranges close to the market. They were 20 out of 35 in first zone (upto 2 kilometer), 30 out of 55 in second zone (2.1-4 kilometers) and 45 out of 70 in third zone (4.1-6 kilometers). While in the fourth and fifth zone there was big size of farmers coming to the market (Table 6.14).

6.14 Producer Sellers Coming from Different Zones in Dhanipur Regulated Market of Aligarh District

Size of Landholdings (in acres)	Different Zones around Dhanipur Regulated Market				
	1st Zone Upto 2 Kms	2nd Zone 2.1-4 Kms	3rd Zone 4.1-6 Kms	4th Zone 6.1-8 Kms	5th Zone Above 8 Kms
0-4	10	15	25	5	5
4.1-8	10	15	20	30	5
8.1-12	5	10	10	20	25
12.1- 16	5	10	10	10	15
Above 16	5	5	5	5	20

Source-Field Survey-2004-2005

6.4.2 Khair Market

Table 6.15 explains that in Khair regulated market, the farmers having upto 4 acres size of landholding are coming in good ratio from second zone. As we move from the market towards third, fourth and fifth zones, the number of participants of this group is decreasing. The farmers having 4.1-8 acres size of landholding are having highest participation again in the second zone (2.1-4 kilometers). The highest participation in the first zone is from the group of farmers having 8.1-12 acres size of land holdings. The next group (12.1-16 acres) of farmers' having highest participation from the second zone (2.1-4 kilometers) in the Khair market.

The farmers having above 16 acres of size of land holding participated in good numbers in the first and second zones. The highest number of participants are coming from the second and first zone (73 and 49). In Khair market most of the farmers from all size of landholdings are coming from first and second zones. It is because of presence of Palwal market which is close to Khair market located in Haryana province. Therefore, the farmers of the

Khair market located in Haryana province. Therefore, the farmers of the villages located on the periphery of Palwal market can sell their produce in Palwal market.

6.15 Producer Sellers Coming from Different Zones in Khair Regulated Market of Aligarh District

Size of Landholdings (in Acres)	Different Zones around Khair Regulated Market				
	1st Zone Upto 2 Kms	2nd Zone 2.1-4 Kms	3rd Zone 4.1-6 Kms	4th Zone 6.1-8 Kms	5th Zone Above 8 Kms
0-4	8	18	12	10	2
4.1-8	6	20	14	5	5
8.1-12	15	10	5	5	5
12.1- 16	10	15	5	4	1
Above 16	10	10	8	5	2

Source-Field Survey-2004-2005

6.4.3 Atrauli Market

Table 6.16 shows that highest participation of producer sellers (57 producer sellers) is from the first zone (upto 2 kilometers) in the Atrauli market. And as we move away from the centre of Atrauli market the number of participants start decreasing continuously (44, 27, 18 and 14 producer sellers). The participants having upto 4 acres size of landholding are coming in good ratio (20 producer sellers out of 57) from the first zone, which is the highest among all the zones. This type of participation of farmers (having different size of land holdings) is because Atrauli comes in 'B' grade market and the size of land holdings of farmers of this region is very small. That is why only those participants (farmers) whom villages are located very near to the market are coming to Atrauli regulated market.

6.16 Producer Sellers Coming from Different Zones in Atrauli Regulated Market of Aligarh District

Size of Landholdings (in Acres)	Different Zones around Atrauli Regulated Market				
	1st Zone Upto 2 Kms	2nd Zone 2.1-4 Kms	3rd Zone 4.1-6 Kms	4th Zone 6.1-8 Kms	5th Zone Above 8 Kms
Upto-4	20	18	10	8	4
4.1-8	15	10	5	5	5
8.1-12	10	8	6	3	3
12.1.- 16	8	6	4	1	1
Above 16	4	2	2	1	1

Source-Field Survey-2004-2005

6.4.4 Chharra Market

Table 6.17 reveals the fact that the farmers having upto 4 acres size of land holding, coming in good ratio (25 producer sellers) from the first zone in the Chharra market. But as we move from the center of Chharra market the number of participants continuously decreasing. And from the outer most zone (above 8 kilometers) no participant is coming from the category of below 4 acres land holding. Highest participants (95 producer sellers) from different size of land holdings are coming to Chharra market from the first zone (upto 2 kilometers). This is because of the fact that no other regulated market is available in this region and Chharra is the biggest grain market.

6.17 Producer Sellers Coming from Different Zones in Chharra Regulated Market of Aligarh District

Size of Landholdings (in Acres)	Different Zones around Chharra Regulated Market				
	1st Zone Upto 2 Kms	2nd Zone 2.1-4 Kms	3rd Zone 4.1-6 Kms	4th Zone 6.1-8 Kms	5th Zone Above 8 Kms
Upto-4	25	15	10	10	0
4.1-8	20	10	15	10	5
8.1-12	15	10	10	10	5
12.1- 16	20	5	5	5	5
Above 16	15	10	5	5	5

Source-Field Survey-2004-2005

The domination of big farmers/producer sellers coming from fourth and fifth zone is due to their big size of marketable surplus which is economically viable to sell in the market as the transport and time cost is distributed in huge weight of surplus and per unit weight transport cost is reduced. Contrary to this marginal and very small farmers generally have small marketable surplus, which is not economically profitable for them to sell their product in distant regulated markets. Hence, first to third zone is economically viable for the farmers to come to the regulated market and sell their products in it. They can also save their time and can utilize it in some other economic activities. The assumption that the farmers having big size of land holdings can travel far distances sell their commodities in the regulated markets without considering the transportation and other cost is found to be correct in the study area.

References

Ibrahim, R.(1984), Market Centers and Regional Development, B.R Publishing Corporation, pp.184-242.

Mishra, S and Routray, J.K (1995), Role of Market Towns in the Delhi Metropolitan Region-A Case Study of "Palwal", Haryana, *Asian Profile*, Vol,23, No.4, pp-329-348.

Neal W.L, Mavi. H.S. and Singh J.P (1975) "Kurali Market: A Report on the Economic Geography of Marketing in North Punjab" Economic Development and Cultural Change, Vol. 13, No.2, pp. 129-168.

Shafi, M (1982), Location of Agricultural Activity: Von Thunen Model, The Geographer, Vol XXIX, No. 1, pp 14-24

CHAPTER-7

REGULATED MARKETS AND AGRICULTURAL DEVELOPMENT

7.1 Introduction

Agricultural development is a multi-dimensional concept in which crop productivity is one of the important aspects. Crop productivity can simply be measured by the yield per hectare of various crops. Diversification of cropping is another important aspect of agricultural development being supported not on economic grounds but on considerations of self-reliance in agricultural production and maintenance of soil fertility. Commercialization of agriculture is very important dimension of agricultural development in the context of marketing. The degree to which market forces have penetrated in an area and the scale upon which they operate will be the crucial factors in almost every question related to agricultural development[1]. A directed effort at commercialization of agriculture may involve articulation of farmer's psychology toward that end, provision of marketing facilities and above all rise in the yield of agricultural produce.

Non-exploitative and tension-free agrarian relations are essential ingredient of agricultural development. The nature of relations between different categories of farmers may be inferred from the comparative benefits they are deriving from the various decision-making bodies in respect of supply of irrigation, fertilizers, high yielding variety of seeds, loans, marketing facilities and land reform policies.[2] Thus agricultural development explains the quality of the agricultural system of a region in terms of productivity, commercialization and diversification consistent with a desired state of agrarian relations and balance of ecological system.

Regulated markets are the collection point of agricultural produce and reflect the regional development in general and agricultural development in particular. These places are the contact points of rural people with the residents of urban or economically developed places whom they sell their produce in the

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1 Hunter Guy (1969), Modernizing Peasant Societies, Oxford University Press, London.

2 Mohammad, N (1992), Dynamics of Agricultural Development, edited in vol. seven, New Dimensions in Agricultural Geography, Concept Publishing Company, New Delhi, p.32.

market and purchases either of agricultural inputs or other items of daily necessities.

Thus, for the agricultural development in the study area with reference to regulated markets, there should be an assessment in the growth of marketed surplus in different markets. Consequent to growth in marketed surplus in the market, there would be changes in cropping pattern, crop combination, growth of area under tillage, changes in the quality of production, and yields, changes in irrigated area, consumption of fertilizers, growth of technological factors etc. This kind of enquiry will be helpful in determining the impact of regulated markets in agricultural development.

In this chapter efforts have been made to understand the factors crucial in agricultural development. Moreover, relation between the market and agricultural development variables has been examined to understand the role being played by the regulated market in agricultural development of the district.

7.2 Methodology

The year of 1991-92 and 2002-2003 has been taken for the study to understand the overall agricultural development in Aligarh district. The reference period (1991-92 and 2002-2003) has not taken in isolation but their triennium has been calculated. Block has been taken as unit of study. In first section of this chapter general growth of agricultural development has been analyzed. While in second section the agricultural development has been examined with reference to regulated markets. To understand the causal relationship between market and agricultural development, some variables have been selected. Variables have been selected from the factors which have direct relation with agricultural production and productivity.

In the present study market arrival is considered as an independent factor to understand the effect of market on agricultural development. The agricultural variables like production, yield, cropped area, irrigated area, fertilizer consumption, tractors, price of commodities, storage facilities, cropping intensity etc. have been taken as dependent variables.

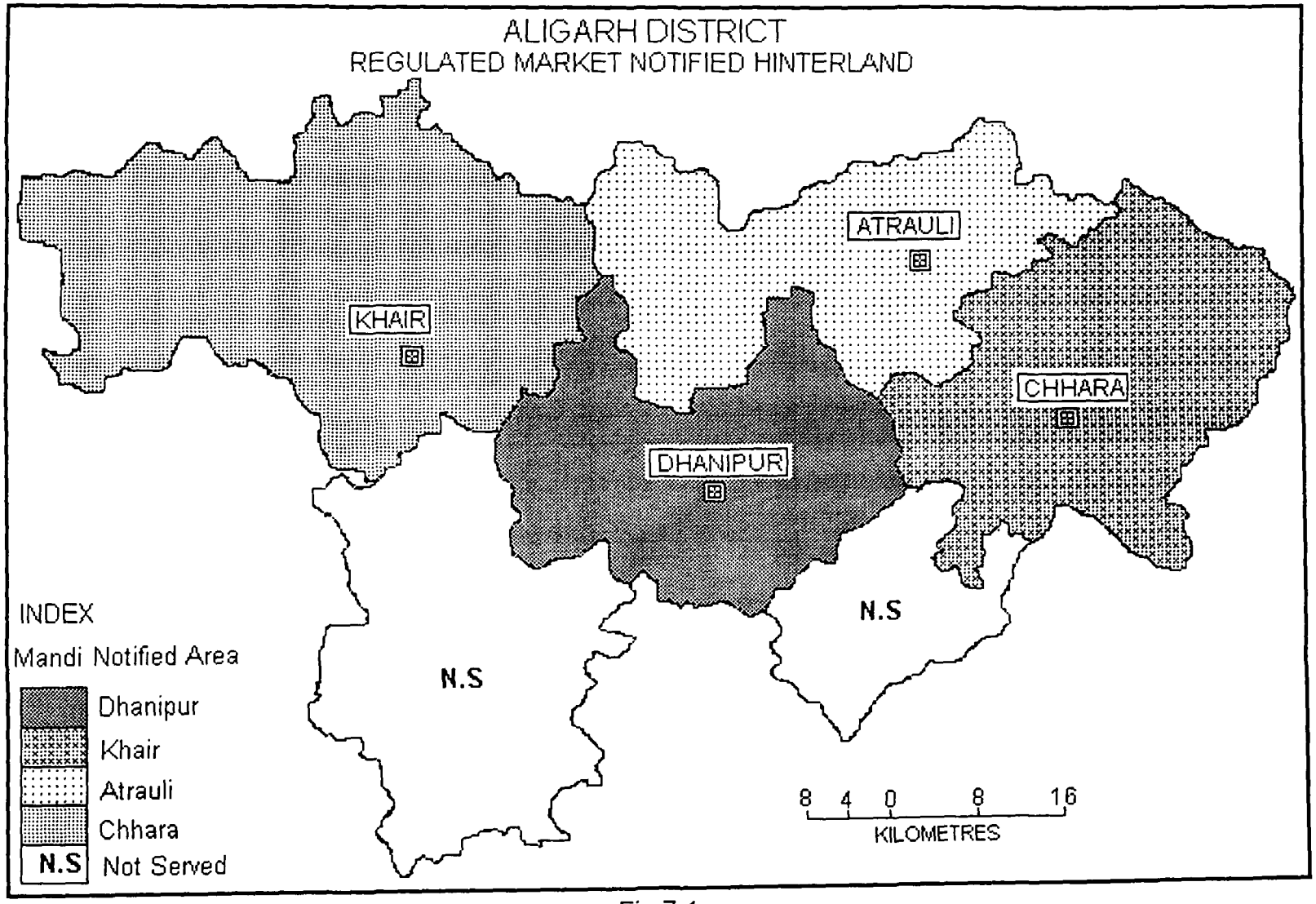
ALIGARH DISTRICT
REGULATED MARKET NOTIFIED HINTERLAND
KHAIR
ATRAULI
CHHARA
DHANIPUR
N.S
N.S
INDEX
Mandi Notified Area
Dhanipur
Khair
Atrauli
Chhara
N.S
Not Served
8 4 0 8 16
KILOMETRES

Fig 7.1

The regulated markets were taken as a separate entity because each of them has its own defined trade area. Dhanipur regulated market encompasses Dhanipur and Lodha blocks in its trade influence. Khair regulated market covers Tappal and Khair blocks, Chharra regulated market serves Bijauli and Gangeri blocks, while Atrauli regulated market has Jawan and Atrauli blocks as its notified area (Fig 7.1).

Regulated market arrival considered as one of the important performance variables to understand the strength of regulated market. Therefore, market arrival has been taken from each market, whereas to understand the role of regulated markets in agricultural development, factors associated with agricultural development has been taken i.e. production, yield, area, irrigated area, fertilizer consumption, tractors, price of agro-commodities, roads, market infrastructure, seasonal agro-markets, number of godowns, capacity of godowns, cropping intensity etc.

Karl Pearson's coefficient of correlation technique has been used to assess the causal relationship between the variables of regulated markets and agricultural development for two different periods, viz. 1991-92 and 2002-2003 on the basis of mean of 14 variables for each period. The level of significance of these variables correlation has been determined at 5 degree of freedom based on student's 't' test technique.

7.3 Cropping Pattern

Cropping pattern means the proportion of area under different crops at a point of time.[1] The adoption of crops in any area can be understood by the physical characteristics and socio-economic conditions of the people in the concerned area. In order to analyze the cropping pattern in Aligarh district, it would be useful to give some preliminary ideas about the crops with sowing and harvesting seasons etc. As it is well known, that in India, there are three seasons e.g., *kharif* or the season of summer crops, *rabi* or the season of winter crops and *zaid* crops. June to November is the period of *kharif* crops,

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[1] Kanwar, J.S. (1968), Cropping Patterns, Scope and Concept, Proceedings of the Symposium, on Cropping Pattern in India, ICAR, P.13.

November to April is the period for *rabi* crops and April to June is the period for *zaid* crops.

The crops of *kharif* season are bajra (pearl millets), rice, *jowar* (sorghum), maize, *arher* (pigeon pea), *moong* (green gram), *urd* (black gram), groundnut, sugarcane which needs high temperature and plentiful water supply. The crops of *rabi* season are wheat, barley, gram, *masoor* (lentil), peas and potato which require cool weather and moderate supply of water. Water melon, musk melon, cucumber, jackfruit etc., are included in *zaid* crops. Regulated markets of the study area deal different agricultural commodities according to the rhythm of the seasons. Table 7.1 shows that in the total cropped area of the district 58 per cent is accounted by *rabi* crops, 38.51 per cent by *kharif* crops and 3.48 per cent by *zaid* crops. Ranking at the level of the development blocks shows that Tappal (28322 hectares), Gangeri (19286 hectares) and Atrauli (2425 hectares) are the blocks having largest areas under *rabi, kharif* and *zaid* crops (Fig. 7.2).

Table 7.1 Area under Rabi, Kharif, and Zaid Crops in Aligarh District (2002-2003)

S. N	Blocks	Rabi	Kharif	Zaid	Total Cropped Area
1	Tappal	28322	17286	677	46285
2	Chanduas	26910	15240	944	43094
3	Khair	27938	15944	829	44711
4	Jawan	20091	16873	1610	38574
5	Lodha	20625	12491	1307	34423
6	Dhanipur	20226	16408	1949	38583
7	Gonda	23967	12914	788	37669
8	Iglas	20971	11426	1106	33503
9	Atrauli	22471	17481	2425	42377
10	Bijauli	16803	12025	783	29611
11	Gangeri	26626	19286	2094	48006
12	Akrabad	18919	13704	1513	34136
	Total Rural	273869	181078	16025	470972
	Urban	3288	2945	647	6880
	District Total	277157 58%	184023 38.51%	16672 3.48%	477852 100%

Source- Statistical Magazine, District Aligarh *Note- Area in Hectares*

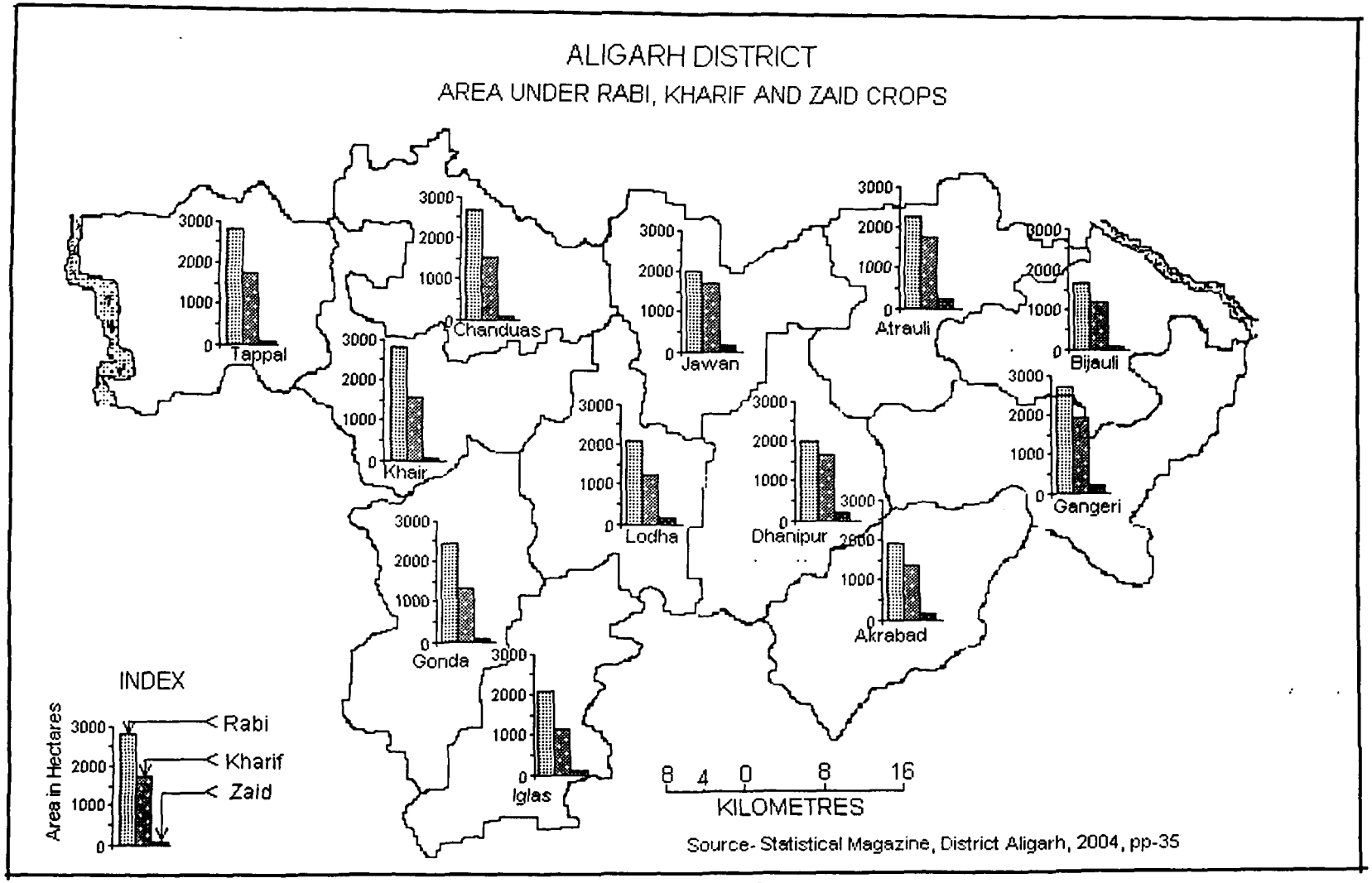
ALIGARH DISTRICT
AREA UNDER RABI, KHARIF AND ZAID CROPS
Tappal
Chanduas
Jawan
Atrauli
Bijauli
Khair
Lodha
Dhanipur
Gangeri
Gonda
Akrabad
Iglas
INDEX
Area in Hectares
Rabi
Kharif
Zaid
8 4 0 8 16
KILOMETRES
Source- Statistical Magazine, District Aligarh, 2004, pp-35

Fig 7.2

Ranking of different agricultural commodities in the district on the basis of area under each crop in 2002-2003 shows that wheat, *bajra*, maize, paddy, mustard, *arhar*, barley, sugarcane, potato, *moong*, groundnut, cotton, peas, gram, onion and lentil are the leading crops in descending order. The crops of *moong*, groundnut, cotton, peas, gram, onion and lentil are having less than one per cent of the total cropped area of the district (Table.7.2).

Table 7.2 Rank of Main Crops in Aligarh District (2002-2003)

Crops	Rank	Area (Hectares)	Percentage of Total Cropped Area
Wheat	I	212456	49.71
Bajra	II	75675	17.71
Maize	III	26320	6.16
Paddy	IV	26117	6.11
Mustard	V	21884	5.12
Arhar	VI	18703	4.38
Barley	VII	18776	4.39
Sugarcane	VIII	10135	2.37
Potato	IX	8667	2.03
Moong	X	3412	0.80
Ground nut	XI	2233	0.52
Cotton	XII	1308	0.31
Peas	XIII	804	0.19
Gram	XIV	772	0.18
Onion	XV	103	0.02
Lentil	XVI	3	0.001

Source- Statistical Magazine, District Aligarh

The ranking of crops on the basis of wholesome measure would naturally require an assessment of the monetary value of each crop. The value can be measured in terms of the total price. Official statistical data are available for the retail price of selected agricultural commodities in the rural areas of the district for the year 2002-2003. It is possible to estimate the ranking of crops on the basis of their monetary value by multiplying the total product with prevailing price. It can be understood from the table 7.3 that wheat is the most important crop of the study area. Its annual output has a monetary value of Rs.465.39 crores, which is more than the joint monetary value obtained from potato, sugarcane, bajra, paddy, mustard, barley, *arhar*, maize, lentil, *moong*, peas, gram and cotton having second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth, eleventh, twelve, thirteenth and fourteenth ranks respectively.

Table 7.3 Value Based Ranking of Crops in Aligarh District (2002-2003)

Crops	Rank	Price Per Kg in Rupees	Quantity Produced in (Metric Tonnes)	Value in Crores of Rupees
Wheat	I	6.48	7182040	46539
Potato	II	4.05	2125320	86.07
Sugarcane	III	1.25	6295050	78.68
Bajra	IV	5.15	1166900	60.09
Paddy	V	9.77	459920	44.93
Mustard	VI	17.22	225690	38.86
Barley	VII	5.48	662270	36.29
Arhar	VIII	16.47	146850	24.18
Maize	IX	5.65	254910	14.40
Lentil	X	17.86	21770	3.88
Moong	XI	17.96	13530	2.42
Peas	XII	11.71	13400	1.56
Gram	XIII	17.86	7440	1.32
Cotton	XIV	15.09	2010	0.30
Onion	-	-	-	-
Groundnut	-	17.5	-	-

Source- Statistical Magazine District Aligarh

7.4 Changing Pattern of Crop Combination

Comprehensive understanding of crop combination in an area makes it possible to analyze the development of agricultural practices and crop preferences. These changes have a direct relationship with the commercial aspects of agricultural activities. Crop combination is of great significance to assess the impact of marketing on agricultural development. The present study focus upon the analysis of crop combination in the Aligarh district, using the available data at block level for year of 1991-92 and 2002-2003 to understand the changes, taken place during this period.

In the present study, Weaver's method (1954) has been used to find out the crop combination region in the district Aligarh. In his work Weaver calculated deviation from the real percentage of crops for all possible combination in the component aerial units against a theoretical standard. The theoretical curve for the standard measurement was employed as given below:

Monoculture: 100 per cent of the total harvested crop land in one crop

Two crop combination: 50 per cent in each of two crops

Three crop combination: 33 ½ per cent in each of three crops and so on down the scale.

Table 7.4 Crop-Combination Zones of Aligarh District

S. N	Blocks	1991-92		2002-03	
		Number of Zones	Crop Combination	Number of Zones	Crop Combination
1	Tappal	7	Wheat, Bajra, Mustard, Maize, Barley, Arhar, Paddy	7	Wheat, Bajra, Paddy, Mustered, Arhar, Maize, Barley
2	Chandaus	6	Wheat, Mustard, Bajra, Maize, Barley, Arhar	7	Wheat, Bajra, Mustered, Arhar Maize, Barley, Paddy
3	Khair	7	Wheat, Bajra, Mustard, Maize, Barley, Arhar, Paddy	7	Wheat, Bajra, Mustered, Paddy, Barley, Arhar, Maize
4	Jawan	4	Wheat, Bajra, Maize, Mustered	7	Wheat, Maize, Paddy, Bajra, Arhar Mustered, Barley
5	Lodha	5	Wheat, Bajra, Mustered, Barley, Maize	7	Wheat, Bajra, Arhar Mustered, Barley, Maize, Paddy,
6	Dhanipur	4	Wheat, Mustered, Bajra, Maize	7	Wheat, Paddy, Bajra, Maize Mustered, Arhar, Barley,
7	Gonda	7	Wheat, Bajra, Mustered, Barley, Maize, Arhar, Paddy	2	Wheat, Bajra
8	Iglas	4	Wheat, Bajra, Mustered, Barley	2	Wheat, Bajra
9	Atrauli	4	Wheat, Bajra, Maize, Mustered	7	Wheat, Bajra, Maize, Paddy Barley, Arhar Mustered,
10	Bijauli	4	Wheat, Bajra, Mustered, Maize	2	Wheat, Bajra
11	Gangeri	7	Wheat, Maize Bajra, Mustered, Barley, Arhar, Paddy	2	Wheat, Bajra
12	Akrabad	7	Wheat, Bajra, Mustered, Maize, Barley, Arhar, Paddy	7	Wheat, Bajra, Maize, Paddy Barley Mustered, Arhar

Source- *Statistical Magazine, District Aligarh* *Appendix IV and V*

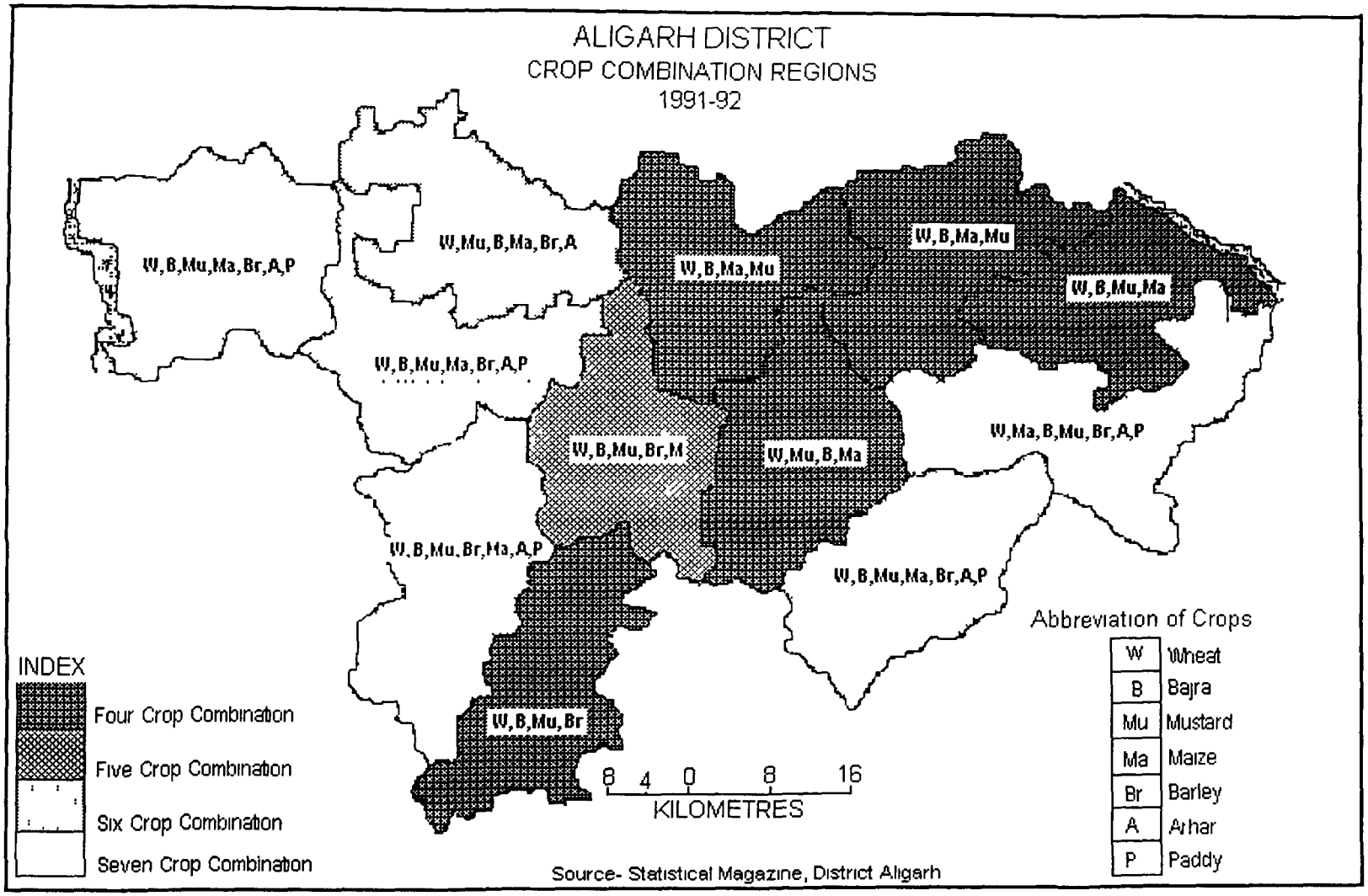
ALIGARH DISTRICT
CROP COMBINATION REGIONS
1991-92
W,B,Mu,Ma,Br,A,P
W,Mu,B,Ma,Br,A
W,B,Ma,Mu
W,B,Ma,Mu
W,B,Mu,Ma
W,B,Mu,Ma,Br,A,P
W,B,Mu,Br,M
W,Mu,B,Ma
W,Ma,B,Mu,Br,A,P
W,B,Mu,Br,Ma,A,P
W,B,Mu,Ma,Br,A,P
W,B,Mu,Br
INDEX
Four Crop Combination
Five Crop Combination
Six Crop Combination
Seven Crop Combination
8 4 0 8 16
KILOMETRES
Source- Statistical Magazine, District Aligarh
Abbreviation of Crops
W Wheat
B Bajra
Mu Mustard
Ma Maize
Br Barley
A Arhar
P Paddy

Fig-7.3

For the determination of the minimum deviation the standard deviation method was used:

$$SD = \sqrt{\frac{\Sigma d^2}{n}}$$

Where 'd' is the difference between the actual crop percentages in a given areas unit and appropriate percentage in theoretical curve and 'n' is the number of crops in a given combination.

$$d = d^2/n$$

Crop combination regions based on Weaver's method worked out for the year 1991-92 and 2002-2003 it is clear from the figures 7.3 and 7.4 that there are two, four, five, six and seven crops combination regions have been discovered in the district Aligarh.

Block level analysis change in crop combination region during the period of 1991-92 to 2002-03 has shown that eight blocks i.e. Tappal, Chandaus, Khair, Jawan, Lodha, Dhanipur, Atrauli and Akrabad have recorded seven crop combinations in the period of 2002-2003. In all the blocks except Jawan and Dhanipur the crop of wheat and *bajra* were common while third rank crop varies from one block to another.

In the period 1991-92, five blocks namely Tappal, Khair, Gonda, Gangeri and Akrabad have seven crop combinations i.e., wheat, *bajra,* mustard, maize, barley, *arhar*, paddy while the block of Jawan, Dhanipur, Iglas, Atrauli and Bijauli have four crop combination regions. The crops in these blocks were wheat, bajra, maize, mustard in the blocks of Jawan. Wheat, mustard, *bajra,* maize in Dhanipur blocks. Wheat, *bajra,* mustard, barley in Iglas block. Wheat, *bajra*, maize, mustard in Atrauli block and wheat, *bajra*, mustard, maize in the block of Bijauli.

During 1991-92 block of Chandaus has six crops combination i.e. wheat, mustard, bajra, maize, barley and *arhar*. Lodha block has five-crop combination with the crops of wheat, *bajra*, mustard, barley, and maize. The above analysis reveals the fact that though the number of crops combination in

different blocks remains the same but the ranking of the crops have been changed.

Seven crop combination regions include the development blocks of Tappal, Chandaus and Akrabad in study area. Three blocks of Tappal, Khair and Akrabad have same crops in the combination in between the period of 1991-92 and 2002-2003, but ranking of crops have been changed. For example in Tappal block the crop combination include the crop of wheat, bajra, mustard, maize, barley, *arhar*, paddy during the period of 1991-92 but sequence has changed to the crop of wheat, *bajra,* paddy, mustard, *arhar*, maize, barley. Same conditions are found in developmental blocks of Khair and Akrabad.

The crop combination in the developmental blocks of Chandaus, Jawan, Lodha, Dhanipur, Gonda, Iglas, Atrauli, Bijauli and Gangeri has completely changed during the period of 2002-2003. In the period of 1991-92 Chandaus block has six crops combination region (wheat, mustard, *bajra,* maize. barley, *arhar*), while during the period of 2002-03 it become seven crops combination region (wheat, *bajra,* mustard, *arhar*, maize, barley and paddy). Four blocks namely Jawan, Lodha, Dhanipur and Atrauli have four and five combination regions in the period of 1991-92 and the crops in the combination were different from one block to another block.

In the block of Jawan the crop of wheat, maize, paddy, bajra, *arhar*, mustard, barley were in combination during the period of 2002-03. While the crop of wheat, *bajra*, maize, mustard formed crop combination in the same block during the period of 1991-92. In Lodha block the crop of wheat, *bajra*, *arhar*, mustard, barley, maize, paddy were in combination during the period of 2002-03, while the crop of wheat, *bajra*, mustard, barley, maize were in combination of 1991-92. Same conditions were with the developmental blocks of Dhanipur and Atrauli. The development blocks of Tappal, Chanduas, Khair, Jawan, Lodha, Dhanipur, Atrauli and Akrabad were having seven crop combination due to their location around regulated and sub-regulated markets because the demand of these crops in the market was very high.

The crop of rice has changed as new crop during the period of 2002-03 and become second and third ranking crop in most of the blocks of study area. High demand for quality rice, and good prices in the market, better irrigation facilities in the form of canal irrigation which leads to higher yield are some of the factors responsible for increase of rice as the leading crop.

Four blocks namely Gonda, Iglas, Bijauli, and Gangeri fall in the category of two crop combination during the period of 2002-03, while they were seven and four crops combination regions in the period of 1991-92. It may be the caused by more emphasis on the production of cereals i.e., wheat and *bajra* as the demand for these crops in the market is increasing.

It is very much clear from the Table 7.4 that wheat is the first ranking crop among all the crops grown in the study area. Wheat is combined with other combinations almost in every block of the study area. The farmers devote their land to several crops depending upon their socio-economic conditions.

It is clear that farmers are devoting more and more area to the crops of wheat, paddy, *bajra*, mustard, *arhar*, maize and barley, which are in high demand in the markets of the study area. Initially non-food crops are kept in the category of commercial crops in present time, the crop of wheat, paddy, maize etc. are also marketed at large scale. Therefore, exclusion of these crops from the list of commercial crops is not logical. Thus it is not the crop itself but the purpose of its production, which places any crop in the class of commercial or non commercial crops[1].

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[1] Jain, C.K and Jain, A.K (1999), Commercialization of Agriculture and its Relation with Economic Development in the Ganga Basin of Madhya Pradesh, 'Commercial Activities and Development in the Ganga Basin', Shrivastava, V.K. (eds), pp.120-121

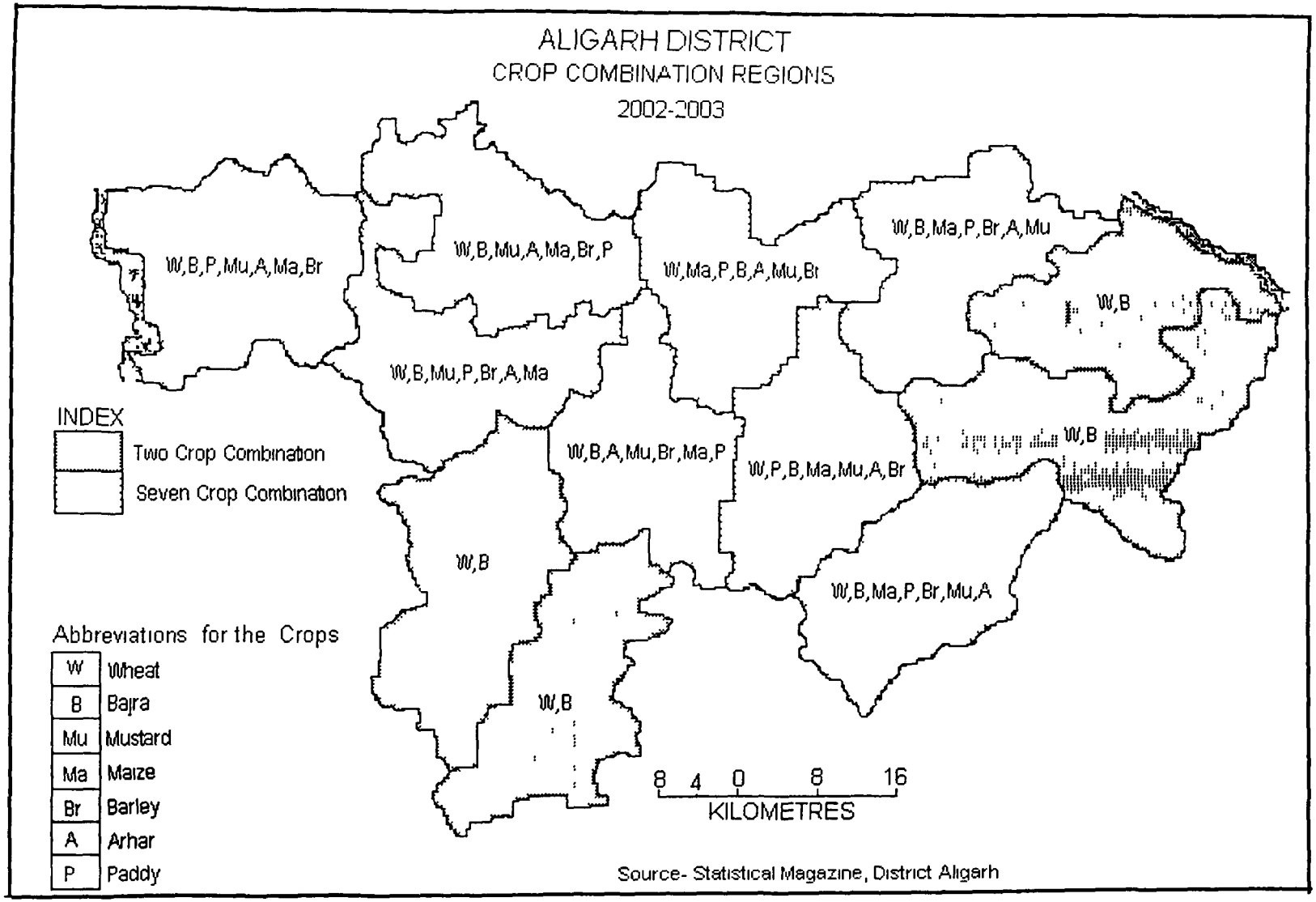
ALIGARH DISTRICT
CROP COMBINATION REGIONS
2002-2003
W,B,P,Mu,A,Ma,Br
W,B,Mu,A,Ma,Br,P
W,Ma,P,B,A,Mu,Br
W,B,Ma,P,Br,A,Mu
W,B
W,B,Mu,P,Br,A,Ma
W,B,A,Mu,Br,Ma,P
W,P,B,Ma,Mu,A,Br
W,B
W,B,Ma,P,Br,Mu,A
W,B
INDEX
Two Crop Combination
Seven Crop Combination
Abbreviations for the Crops
W Wheat
B Bajra
Mu Mustard
Ma Maize
Br Barley
A Arhar
P Paddy
8 4 0 8 16
KILOMETRES
Source- Statistical Magazine, District Aligarh

Fig-7 4

7.5 Growth in Area, Production and Yield of Crops

Since the period of 1991-92, a considerable change has been taken place in terms of net sown area, total cropped area and yield per hectare of land. From the beginning of the period of 1991-92, cropping pattern of the study area has started to react more vigorously due to the development of new markets and enhanced socio-economic level of the farmers and their interaction with the urban centres and increased demand and supply of different agricultural commodities. Changes in the cropping pattern at the block-level has already been analyzed but it is rewarding and important to sum up these changes under growth in area put to agricultural use, changes in the quantity of production and improvements in the yield per hectare of land under different crops. Therefore, an attempt has been made to examine the changes in area, production and yield per hectare of agro-commodities at district level, over a period of twelve years in between 1991-92 and 2002-03. These changes at district level have been discussed under the following headings.

7.5.1 Growth of Area under Different Crops

Table 7.5 shows net sown area, total cropped area and area sown more than once. This table reflects the changes during 12 years interval from the period of 1991-92 to 2002-03. Data shows frequent fluctuations in terms of net sown area, total cropped area and the area sown more than once. Continuous increase or decrease has not been observed. Taking into consideration of entire period of 12 years from 1991-92 to 2002-03 the net sown area has increased by 1.57 per cent, area sown more than once by 2.90 per cent and the total cropped area by 2.05 per cent. Good percentage of increase in area sown more than once reflects an increase in the cropping intensity of that region. Annual fluctuations represent the variable nature of the climatic conditions, increase in population and fluctuating increase in net sown area, area sown more then once and ever-increasing demand for the total cropped area will be helpful in fulfilling the agricultural commodities especially food grains.

Table 7.5 Net Sown Area, Area Sown More then once and Total Cropped Area

Area	1991-92	2002-2003	Percentage increase or Decrease in 12 years
Net Sown Area	297084	301751	+1.57
Area Sown More than Once	171128	176101	+2.90
Total Cropped Area	468212	477852	+2.05

Source: Appendix VI

7.5.2 Growth in the Production and Yield of Agricultural Commodities

Table 7.6 shows the production of principle crops in the study area. All the cereal crops like wheat, *bajra* and paddy except maize and barley have recorded increased production. The increased production of wheat, *bajra* and paddy vary from 14.51 per cent for wheat, 31.01 per cent for *bajra* and 176.34 per cent for paddy while decreased production of barley was 39.92 per cent and for maize was 44.66 per cent during study period i.e. 1991-92 to 2002-03.

Table 7.6 Production of Agricultural Commodities in Aligarh District

Crops	1991-92	2002-2003	Growth
Wheat	627173	718204	+14.51
Bajra	89066	116690	+31.01
Maize	46067	25491	-44.66
Barley	110233	66227	-39.92
Paddy	16643	45992	+176.34
Mustard	64586	22569	-65.05
Arhar	26300	14685	-44.16
Moong	7677	1353	-82.37
Lentil	1324	2177	+64.42
Gram	8980	744	-91.7
Peas	12540	1340	-89.31
Sugarcane	819244	629505	-23.16
Potato	84411	212532	+151.78
Onion	N.A		
Cotton	857	201	-76.5
Groundnut	4	0	0

Sources-Statistical Magazine, District Aligarh

In pulses crops only lentil recorded increased production of 64.42 per cent while *arhar*, *moong*, peas and gram recorded decreased production between the period of 1991-92 and 2002-2003. Mustard recorded decline in production by 65.05 per cent. Besides, other cash crops like sugarcane and cotton recorded the considerable decline in production.

The production of pulses declined due to low returns in the markets. The increased production of cereals are the reflection of farmers attitude towards the market oriented crops because wheat and paddy are considered as commercial crops due to increasing price in the market. The government is also encouraging the production of wheat and rice through Minimum Support Price (MSP) for increasing stock of food in reserves. Simultaneously potato also registered fast growth to a magnitude of 151.78 per cent during the same period because of increasing facilities of storage as well as markets.

Table 7.7 Yields per Hectare of Principle Crops in Aligarh District

Crops	1991-92	2002-2003	Growth
Wheat	2809	3380	+20.32
Maize	1071	1542	+43.97
Bajra	1084	969	-10.60
Barley	2859	3541	+23.85
Paddy	1514	1761	+16.31
Mustard	848	1031	21.58
Arhar	1100	782	-28.90
Moong	440	378	-14.09
Lentil	681	975	+43.17
Gram	1369	964	-29.58
Peas	1269	1666	-31.28
Sugarcane	60128	62112	+3.29
Potato	16400	24522	+49.52
Onion	N.A		
Cotton	199	0	0
Groundnut	1279	655	-48.78

Sources-Statistical Magazine, District Aligarh. N.A -Not available

It is not sufficient to give only data regarding the production of principle crops because it may gives some misleading information about the reality, therefore it is necessary to give the data about the yield of the principle crops too. Table 7.7 give an account of the changes in the yield per hectare of the principle crops during 12 years from the period 1991-92 to 2002-03. It can be understood by the table that not only the yield per hectare of barley has declined but its total production has got negative growth in the study area. Contrary to this the yield of sugarcane has improved by 3.29 per cent while its production decreased during the same period. The massive increase in the yield has been recorded for potato (49.52 per cent), followed by maize (43.97 per

cent), lentil (43.17 per cent), barley (23.85), wheat (20.32 per cent), paddy (16.31 per cent) and sugarcane (3.29 per cent).

7.6 Growth in Irrigation Facilities

Among all the factors, which lead towards surplus agricultural production, availability of irrigation facilities and their proper use are most crucial. Irrigation is indeed the life-breath of agriculture. All the inputs give better results only when controlled supply of water is made available because crops require water at specific period for growth. Therefore irrigation is an important factor leading towards best returns from other inputs like insecticides and fertilizers.[1]

Table 7.8 Infrastructure of Irrigation and Irrigated Area in Aligarh District

S.N	Infrastructure / Irrigated Area	1991-92	2002-2003
1	Length of Canals (Km)	565	565
2	Govt. Tube wells (Number)	604	624
3	Private Tube wells (Number)	20391	21092
4	Canal Irrigated Area (Hectare)	39121	32830
5	Tube Well Irrigated Area (Hectare)	236053	264529
6	Pump sets Installed on Boring (Number)	45492	50363
Total Irrigated Area		**276285**	**297605**

Sources-Statistical Magazine, District Aligarh.

Presence of *Ganga* and *Yamuna* rivers, which are perennial source of water with a gentle slop, is favorable for the construction of canals. Fertile alluvial soils are also a major factors leading towards development of irrigational facilities in the study area.

In the period of 2002-03, Aligarh district had 294271 hectares net irrigated area in the twelve developmental blocks (Table 7.8 and 7.9). The district is served by canals which have a total length of 565 kms. In the period 2002-2003, the total numbers of private tube-well within the twelve developmental blocks were 21092 as compared to the government tube-wells of 624. Pump sets installed on borings during the period of 1991-92 were 45492 but at present in the period of 2002-2003 their number increased to 50363. It can be understood that the total irrigated area of the district has increased from 276285 hectares during the period of 1991-92 to 297605

[1] Hussain, M (1986), Agricultural Geography, Rawat Publications, New Delhi, p.180

hectares during the period of 2002-03. Canal irrigated area declined from 39121 hectares in the period of 1991-92 to 32830 hectares in the period of 2002-03 (Table 7.8)

Appropriate method are not available for measuring the intensity of irrigation except analysis of the ratio, which exists between the net irrigated area and the total irrigated area, which if expressed in percentage gives a measure of the intensity of irrigation. Table 7.9 shows the block-wise data for this purpose explains that the average intensity of irrigation was 135.6 per cent for the district as a whole. It varies from 114.8 per cent for Iglas block to 155.4 per cent for Jawan block. The intensity of irrigation is very high in Jawan block (155.4 per cent) and Dhanipur block (152.3 per cent).

Table 7.9 Intensity of Irrigation in Aligarh District (2002-2003)

S.N	Blocks	Net Irrigated Area	Total Irrigated Area	Intensity Of Irrigation
1	Tappal	31526	41103	130.3
2	Chanduas	27675	38275	138.3
3	Khair	28133	37600	133.6
4	Jawan	22665	35237	155.4
5	Lodha	21128	29090	137.6
6	Dhanipur	23179	35321	152.3
7	Gonda	24975	29171	116.8
8	Iglas	21953	25203	114.8
9	Atrauli	24525	37590	153.2
10	Bijauli	18482	22248	120.3
11	Gangeri	28891	34863	120.6
12	Akrabad	21139	31401	148.5
	Total Rural	294271	397102	134.9
	Urban	3334	6498	194.9
	District Total	297605	403600	135.6

Source- Statistical Magazine, District Aligarh *Area in Hectares and irrigation intensity in percent*

While Iglas (114.8 per cent) and Gonda (116.8 per cent) blocks which lie in the south-west have very low intensity of irrigation. High intensity of irrigation in the block Jawan and Dhanipur leads to paddy cultivation and the arrival of paddy in Dhanipur regulated market has increased several folds (Fig 7.5).

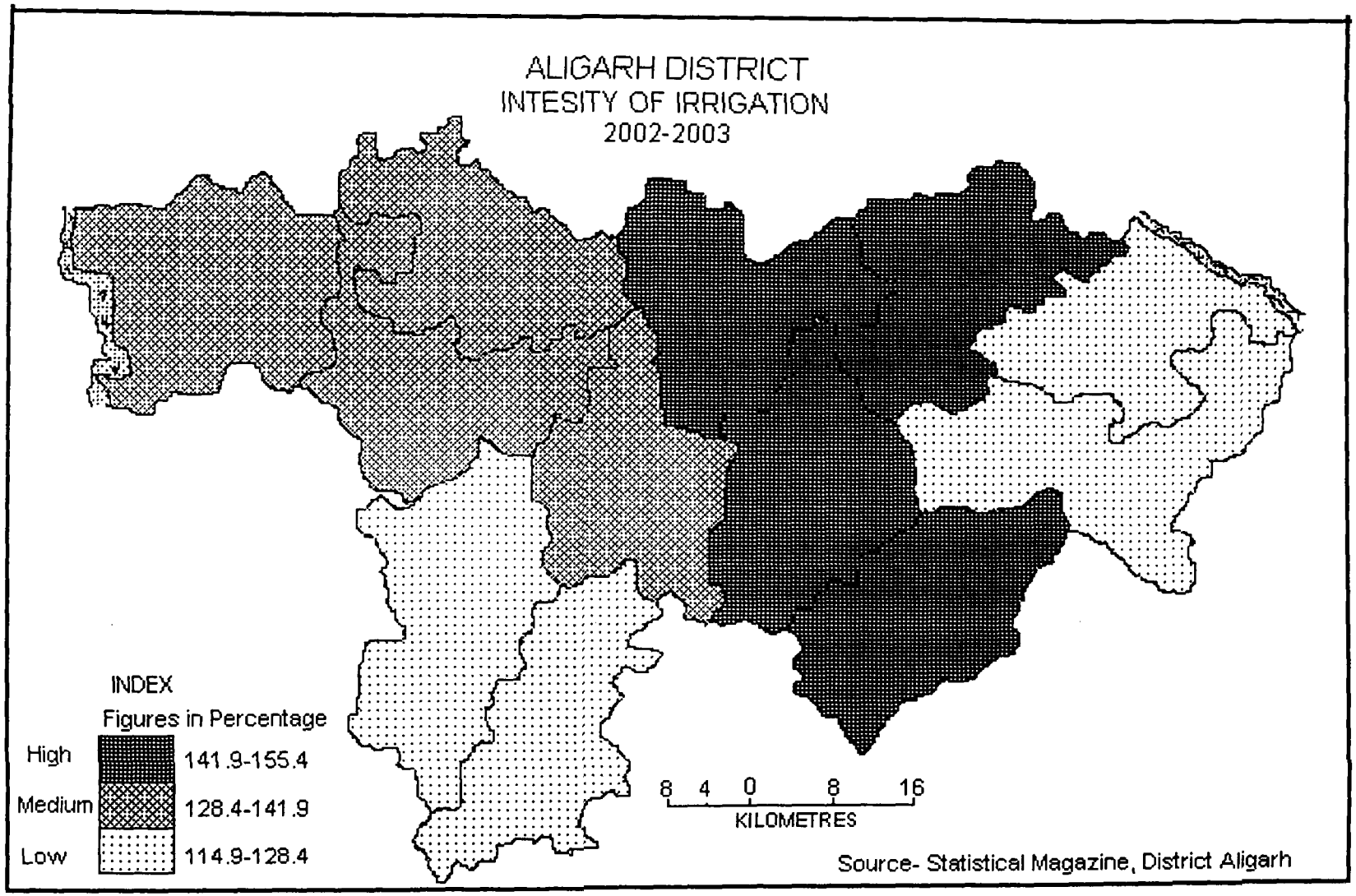
ALIGARH DISTRICT
INTESITY OF IRRIGATION
2002-2003
INDEX
Figures in Percentage
High
141.9-155.4
Medium
128.4-141.9
Low
114.9-128.4
8 4 0 8 16
KILOMETRES
Source- Statistical Magazine, District Aligarh

Fig-7.5

7.7 Growth of Fertilizers Consumption

Fertilizers are also one of the very important inputs for crop production. For achieving the success in the bumper production of any crop the application of fertilizers according to soil quality is must. The importance of fertilizers has been well appreciated by the cultivators. The provision of fertilizers availability at reasonable price, and at appropriate time, is an essential requirement for the growth of crops[1].

With the growing emphasis on commercialization of agriculture by the establishment of agricultural markets in the district, fertilizers constitute an important input in agricultural operations. In any scheme for boosting agricultural output, the use of chemical fertilizers has an important role to play.

Table 7.10 Consumption of Fertilizers in Aligarh District

Fertilizers	1991-92	2002-2003	Percentage of increase or decrease
Nitrogen	24325	30797	+26.60
Phosphorous	9413	18337	+94.80
Potash	487	1398	+187.06

Source Appendix VII *(Metric Tonnes)*

It can be understand by the table 7.10 that the consumption of nitrogen increased from 24325 metric tonns in the period of 1991-92 to 30797 metric tons in 2002-03. The overall increase was 26.60 per cent. In case of phosphorous during the period of 1991-92 its consumption was 9413 metric tonnes but it again increased to 18337 metric tonns in the period of 2002-03. The total increase in phosphorous consumption was 94.80 per cent. Potash consumption in the period of 1991-92 was 487 metric tonns, and in the period of 2002-03 it increased to 1398 metric tonns. The total increase in potash consumption was 187.06 per cent.

7.8 Mechanization of Agriculture

The use of mechanical appliances in agriculture means replacement of human as well as animal power by machinery wherever it is possible,

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[1] Champa, M (1976), Agricultural Development and the Role of Fertilizers, Indian Journal of Regional Science, Vol.9, No.1 and 2, p.151

ploughing is to be done by tractor, sowing and putting of fertilizers by drilling machines and reaping and harvesting by the combined harvesters, threshers and so on. Man by himself produce very little but with the help of machines one can produce much more. The use of machinery in agriculture is not a very easy task especially for small and marginal farmers. Only the farmers of sound economic status are getting the benefits of machinery in agri-business.

The extent of sowing machines and tractors can be judged by table 7.11 and 7.12. It can be understand by the table 7.11 that the high growth of sowing machines was in the blocks of Tappal, Chandaus, Khair, Lodha, Atrauli and Akrabad (176 per cent). While the medium growth can be observed in the blocks of Jawan, Dhanipur, Gonda, Iglas and Gangeri (175 per cent). Bijauli is the block in which the growth of the sowing machines was very low (170 per cent).

Table 7.11 Block-wise Growth of Sowing Machines in Aligarh District

S.N	Blocks	1991-92	2002-2003	Percentage of increase
1	Tappal	384	1060	+176
2	Chanduas	396	1093	+176
3	Khair	98	271	+176
4	Jawan	83	229	175
5	Lodha	100	276	+176
6	Dhanipur	66	182	+175
7	Gonda	182	502	+175
8	Iglas	214	590	+175
9	Atrauli	17	47	+176
10	Bijauli	10	27	+170
11	Gangeri	62	171	+175
12	Akrabad	55	152	+176
	Total Rural	1667	4600	+175
	Urban	60	156	
	District Total	1727	4756	+175

Source- Statistical Magazine, District Aligarh

Table 7.12 explains the block-wise growth of tractors. Gangeri block records highest growth of tractors (22.47 per cent) during study period. After that the blocks of Gonda, Dhanipur (22.44 per cent), Atrauli (22.43 per cent), Lodha (22.39 per cent), Tappal (22.38 per cent), Chandaus (22.35 per cent), Bijauli (22.33 per cent), Khair (22.28 per cent), Iglas (22.24 per cent) and Jawan, Akrabad (22.22 per cent) records the growth of tractors in descending

order. It can be understood from both the tables that the use of mechanical appliances is continuously increasing and the growth is going on in the positive direction.

Table 7.12 Block-wise Growth of Tractors in Aligarh District

S. N	Blocks	1991-92	2002-2003	Percentage of increase
1	Tappal	1197	1465	22.38
2	Chanduas	501	613	22.35
3	Khair	561	686	22.28
4	Jawan	351	429	22.22
5	Lodha	451	552	22.39
6	Dhanipur	441	540	22.44
7	Gonda	499	611	22.44
8	Iglas	418	511	22.24
9	Atrauli	263	322	22.43
10	Bijauli	197	241	22.33
11	Gangeri	356	436	22.47
12	Akrabad	207	253	22.22
	Total Rural	5442	6659	22.36
	Urban	212	259	
	District Total	5654	6918	22.35

Source- Statistical Magazine, District Aligarh 2004

7.9 Inter Correlation between the Variables of Regulated Markets and Agricultural Development

Identification of the causal relationship among the different characteristics of any study is an essential concern of a scientific investigation. A causal relationship between the two characteristics exists only when one of them may logically be considered as the cause of the other. The factor which is supposed to be the cause is known as the independent variable and the one which is supposed to be the effect is known as dependent variable. Thus the variations in independent variable may be explained in terms of the variations in the dependent variables. In case there exists a causal relationship both the values of independent and dependent variables will vary together. The property of co-variation is also termed as correlation.

In a bivariate case if increase in the independent variable also tend to cause an increase in the dependent variable the correlation is said to be positive. On the other hand if an increase in the independent variable tends to

cause a decrease in the values of the dependent variable the correlation is said to be negative.

In case there is no logical basis for a correlation between variables it should not be taken as a causal relationship. Any such relationship is spurious and should not be attempted. This correlation is found only because of the influence of a third unknown variable on both the variables.

Measurement of the degree and direction of correlation helps particularly the geographers in explaining the variations in various geographical features.

On the basis of the curve around which the values of a bivariate data, more, the correlations are classified into two broad categories, namely linear correlation and non-linear correlation. If the values of a bivariate data are moving around a line the correlation between them is said to be linear. On the other hand if the values more around any curve the correlation is said to be non-linear or curvilinear.

The degree of relationship (linear or curvilinear) between any two variables say X and Y on the closeness of the cluster of points to the straight line or to any curve. If the values of X and Y vary such that each points falls exactly on a straight line (or curve) the relationship is said to be perfectly linear (or curvilinear). The higher the deviation of these points from the straight line (or curve) the weaker will be the correlation between X and Y variables.

Measurement of linear Correlation: A precise quantitative measurement of the degree and direction of a linear correlation was suggested by Karl Pearson as follows:

$$r = \frac{\Sigma xy - \dfrac{\Sigma x \Sigma y}{N}}{\sqrt{\Sigma x^2 - \dfrac{(\Sigma x)^2}{N}}\ \sqrt{\Sigma y^2 - \dfrac{(\Sigma y)^2}{N}}}$$

This measure is known as product moment correlation coefficient or simply correlation coefficient. By symmetry it is clear that rxy = ryx = r

where

r = coefficient of correlation
x,y = two given variables, and
n = number of observations

Properties of correlation coefficient (r)

1. If the sign of r is positive the variables x and y are positively related and if the sign is negative, they are negatively correlated.
2. The value of r varies between –1 and +1. The value +1 or –1 indicates a percent positive or negative correlation. As the extent of correlation decreases the value of r approaches zero.

Significance test of correlation coefficient: A coefficient correlation based on a smaller number of observations is generally considered as a sample correlation. Using the test of significance of r it is possible to infer whether the correlation coefficient of the bivariate normal population (the correlation between the same variables but based on a fairly large number of observations) will be zero or not. Under the null hypothesis, that the population correlation is zero, the expression as given below will follow 'the students 't' distribution with (n-2) degree of freedom:

$$t = r\sqrt{\frac{n-2}{1-r^2}}$$

Where n is the number of observations used
r is the coefficient of correlation, and
t is the calculated value

Thus if any computed value of 't' is less than the corresponding tabulated value the correlation coefficient is said to be insignificant, meaning thereby that over a large number of similar observations the two variables will be independent, as the hypothesis that the population correlation coefficient is zero is accepted.

Whatever sample correlation is this case we get may be attributed to the chance factors only. On the other hand if the computed value of 't' is greater then the tabulated 't' the correlation coefficient is said to be significant, and the

population correlation coefficient between the two variables in this case is not considered to be zero.

It is evident from this test that the significance of the correlation coefficient is directly proportional to not only r, but also to (n-2). In some cases, because of a large value of 'n' a smaller correlation coefficient may become significant, whereas in some other cases, a large correlation coefficient may become insignificant because of the smaller value of 'n'.

Based on the technique of Karl Pearson's coefficient of correlation, the causal relationship between the variables of regulated market and agricultural development has been find out for two different periods, viz. 1991-92 and 2002-2003 on the basis of mean of 14 variables for each period. The level of significance of these variables correlation has been determined at 5 degree of freedom based on student's 't' test technique. In present study (1991-92) the given correlation, matrix (table 7.13) reveals the inter correlation between fourteen selected variables of regulated markets and agricultural development (X_1, X_2, X_3, X_4 ..... X_{14}).

The table shows that different variables of market and agricultural development. The table depicts the fact that variable market arrival X_1 though insignificantly but negatively correlated to the variables of X_2, X_3, X_{11}, X_{13} and X_{14}. In the present analysis it is observed that variable X_2 (Growth of area under crops) is very poorly correlated to other variables of regulated markets and agricultural development either positively or negatively. Similarly, X_3 (production of crops) is significantly negatively correlated with X_6 (Consumption of fertilizer) at .05 per cent level of significance having r value of -.964. X_4 (yield) is negatively co-related with X_{11} (seasonal agro-markets) at .05 per cent level of significance having r value of -960 that the size of area plays a little role in the regional variations of agricultural and socio-economic development.

Again, it is X_4 (Yield) is highly positively correlated at .01 per cent level of significance with X_{10} (marketing infrastructure) having r value of .999, therefore, it may be concluded that yield and marketing infrastructure is very

closely correlated. Irrigated area X_5 is negatively correlated with X_1 (Tractor) at .05 per cent significance level having r value of -.985. X_6 (Fertilizer consumption) either negatively or positively correlated with the variables of regulated market and agricultural development. Tractors X_7 is also very poorly correlated with market and agricultural development variables either positively or negatively.

Roads X_9 is significantly negatively co-related with X_{10} market infrastructure at .05 per cent level of significance having r value of -983. Remaining variables i.e. roads X_9, market infrastructure X_{10}, seasonal agro-markets X_{11} and cropping intensity X_{14} is very poorly co-related to the variables of market and agricultural development.

Based on the technique of Karl Pearson's coefficient of correlation, the causal relationship between the variables of regulated markets and agricultural development have been identified for the period of 2002-2003. The level of significance of their correlation is also determined at 5 degree of freedom based on student's 't' test technique.

The given correlation matrix (table 7.14) reveals that the variable market arrival X_1 is insignificantly correlated with all the variables of market and agricultural development except with cropping intensity .945. The variable X_2 area under crops is negatively correlated with the X_{12} (number of godowns) with r value of -958 at .05 level of significance. It is X_3 (production) is negatively correlated with most of variables. Similarly X_4 is positively correlated which has their effect opposite to the previous variables.

It is X_4 positively correlated at .01 per cent level of significance with X_8 price of agro-commodities and X_{10} marketing infrastructure with .05 per cent level of significance with r value of .996 and 990 respectively. Therefore, it may be concluded that X_8 price and X_{10} marketing infrastructure is very highly positively correlated with other variables of market and agricultural development

Table 7.13 Coefficient of Correlation between the Variables of Regulated Markets and Agricultural Development 1991-92

		X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}
Market Arrival	X_1	1.000													
Area	X_2	.861	1.000												
Production	X_3	.583	.898	1.000											
Yield	X_4	-.381	.063	258	1.000										
Irrigated Area	X_5	-.035	.231	.578	-.031	1.000									
Fertilizer Consumption	X_6	-.563	-.904	-.964 *	- 437	-.378	1.000								
Tractors	X_7	-.026	-.351	-.696	-.096	-.985*	.525	1.000							
Price Of Agro-Com	X_8	-.050	.340	.406	.935	-.173	-.615	.013	1.000						
Roads	X_9	-.011	.472	.656	.898	.211	-.786	-.366	.925	1.000					
Market Infrastructure	X_{10}	-.425	.013	.213	.999 **	-.044	-.393	-.078	.920	.876	1.000				
Periodic Agro.Markets	X_{11}	.182	-.306	-.516	-.960*	-.154	.661	.300	-.939	-.983*	-.947	1.000			
Number of Godowns	X_{12}	-.387	.132	.513	.795	.579	-.535	-.666	.637	.835	.789	-.862	1.000		
Capacity of Godowns	X_{13}	.409	.749	.736	.687	-.020	-.889	-.153	.878	.886	.651	-.812	.503	1.000	
Cropping Intensity	X_{14}	.911	.669	.273	-.347	-.444	-.334	.386	.007	-.116	-.380	.245	-.600	.357	1.000

* Correlation is significant at the 0 05 level (2-tailed)
** Correlation is significant at the 0 01 level (2-tailed)

. Moreover, X_4 is negatively correlated with X_{11} at .05 per cent level of significance with r value of -.970. The variable X_5 irrigated area is positively correlated with most of variables. Similarly, X_6 fertilizers and X_7 tractors are highly negatively correlated with most of the variables.

One striking feature is observed from the present analysis that correlation between price X_8 and marketing infrastructure X_{11} is highly positively correlated at 1 per cent significance level with r value of .996, therefore, it has very important role in market and agricultural development of the Aligarh district. X_9 (roads) either positively or negatively correlated with all the variables of market and agricultural development in the district. X_9 (roads) is significantly negatively correlated with X_{11} (Seasonal agro-markets) with r value of -.983 at the level of .05 per cent level of significance. The variable X_{10} (marketing infrastructure), X_{11} (Seasonal agro-markets), X_{12} (Number of Godowns), X_{13} (Capacity of Godowns) and X_{14} (Cropping intensity) either positively or negatively correlated with all the variables.

After going through a detail discussion it has been observed that inter correlation between the different variables of regulated markets and agricultural development strongly correlating from 1991-92 to 2002-2003. Therefore, it may be concluded that with the passage of time inter correlation between different variables of regulated markets and agricultural development is increasing. Increasing correlation between different variables indicates that regulated market has important role in agricultural development of the district Aligarh. Thus it supports the hypothesis that there is positive relation between regulated market and agricultural development.

Table 7.14 Coefficient of Correlation between the Variables of Regulated Markets and Agricultural Development 2002-2003

		X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}
Market Arrival	X_1	1.000													
Area	X_2	.196	1.000												
Production	X_3	-.168	.811	1.000											
Yield	X_4	-.326	-.732	-.217	1.000										
Irrigated Area	X_5	-.339	.400	.856	.318	1.000									
Fertilizer Consumption	X_6	-.491	.752	.776	-.499	.492	1.000								
Tractors	X_7	.072	.732	.943	-.078	.874	.525	1.000							
Price Of Agro-Com	X_8	-.384	-.688	-.147	.996**	.384	-.424	-.024	1.000						
Roads	X_9	-.074	-.894	-.551	.921	-.049	-.786	-.366	.885	1.000					
Market Infrastructure	X_{10}	-.457	-.714	-.173	.990*	.356	-.393	-.078	.996**	.876	1.000				
Periodic Agro.Markets	X_{11}	.237	.870	.448	-.970*	-.078	.661	.300	-.948	-.983*	-.947	1.000			
Number of Godowns	X_{12}	-.469	-.958*	-.672	.767	-.245	-.535	-.666	.745	.835	.789	-.862	1.000		
Capacity of Godowns	X_{13}	.367	-.666	-.447	.751	-.039	-.889	-.153	.701	.886	.651	-.812	.503	1.000	
Cropping Intensity	X_{14}	.945	.364	.129	-.255	-.013	-.334	.386	-.293	-.116	-.380	.245	-.600	.357	1.000

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0 01 level (2-tailed).

References

Champa, M (1976), Agricultural Development and the Role of Fertilizers. Indian Journal of Regional Science, Vol.9, No.1 and 2, p.151

Hunter Guy (1969), Modernizing Peasant Societies, Oxford University Press, London.

Hussain, M (1986), Agricultural Geography, Rawat Publications, New Delhi, p.180

Jain, C.K and Jain, A.K (1999), Commercialization of Agriculture and its Relation with Economic Development in the Ganga Basin of Madhya Pradesh, Chapter.5 in 'Commercial Activities and Development in the Ganga Basin', Shrivastava, V.K. (eds), Vol. 46, No.2, pp.120-121

Kanwar, J.S. (1968), Cropping Patterns, Scope and Concept, Proceedings of the Symposium, on Cropping Pattern in India, ICAR, P.13.

Mohammad, N (1992), Dynamics of Agricultural Development, edited in vol. seven, New Dimensions in Agricultural Geography, Concept Publishing Company, New Delhi, p.32.

CONCLUSION AND SUGGESTIONS

Conclusion

The purpose of study is to examine the various aspects of regulated markets and their relationships in agricultural development. The study also aims to suggest improvements in smooth running of regulated markets for the development of agriculture in the study area in particular and the country in general. To understand the role of regulated markets, four regulated markets and nine important crops of the study area have been selected.

It is realized through the study that efficient marketing enables the farmers to grow more agro-commodities from subsistence/semi-subsistence to market oriented. With the passage of time agro-marketing provides incentives to the farmers to grow farm produce for export. Therefore, streamlined movement of the producers' surplus through the regulated markets to the consumers would raise the income level of the farmers and promote the agriculture development and economic development of the study area.

The importance of an efficient agro-marketing was first recognized by the Royal Commission on Agriculture in its report in the year 1928. The commission has recommended the appointment of marketing experts in the agricultural sector of all the major provinces. It laid great emphasis on marketing aspects and observed that the prosperity of the farmers or producers and success of any policy on agricultural development depend to a large extent on the marketing facilities, which is made available to them. Therefore, it is natural to consider that the regulation of agricultural produce market was an essential step in this direction.

Regulated markets are facilitative and service oriented organizations. The idea behind the establishment of these market centers is to rationalize trade policies and producers for an orderly marketing of agricultural produce. Regulated marketing systems also have dynamic role to play in stimulating output and consumption of agro-commodities. Before formulation of any policy for the planners and policy makers to achieve these goals, it seems important to find out the marketing conditions under which surpluses are dispose off in markets. This research work has its genesis of the observation of

general problems which are faced by the farmers in terms of marketing in regulated markets of the study area. An understanding of all these factors in agriculturally developed region would provide important empirical evidences to the market planners and policy makers to formulate the relevant policies which would be of immense help in increasing the efficiency of agricultural marketing and their development.

The farmers and their production activities are the beginning points of marketing. This marketing process starts with the movement of farm products through different channels to the ultimate consumer. The whole process of marketing in the regulated markets of farm products passes through different market participants under certain regulations, so as to keep the producer farmers away from the exploitation.

The two tier analysis of agricultural marketing in Aligarh district provides some insight about their relative importance and role in the agricultural development. The proportion of marketed surplus of agro-commodities at village level, and in regulated markets indicates towards the level of agro-marketing and their effects on the development of agriculture in the district. The study highlights that the modernization, efficiency and vigour of agro-marketing is positively dependent upon the uniformity of marketing practices, uniform regulatory provisions, accessibility to bigger market centers, reduction of market margins and of course on post-harvest storage facilities.

Thus as a generalized statement, it can be argued that structural changes in farming practice and marketing of agro-commodities would lead to effective integration of market centers. These market centers under uniform regulatory measures, being accessible to both small and big farmers, would provide better prospect for agricultural marketing and their effects on agricultural development.

There are two types of trading system in the study area i.e. private trading and public trading. In private trading, the commodities are primarily operated by private traders, like wholesale traders, village traders, itinerant traders, commission agents etc. who purchase the agricultural surplus from the

producers at free rate on the basis of price agreement among the trades and producer sellers.

On the other hand under public (government) trading has come into existence with a view to ensure fair price for producers' surplus as an incentive to increase surplus, to minimize the seasonal fluctuation in price. Regulated markets are one of the most important agencies of agricultural marketing and it comes under the category of public or governmental trading. In the study area regulated markets are one of the important channels of agro-marketing. It accounted for the transaction of 1127061 quintals of wheat, 367449 quintals of paddy/ rice, 101781 quintals of maize, 118063 quintals of pulses, 249864 quintals of potato, 37255 quintals of onion and 289990 quintals of green vegetables of the total transaction of marketed surplus of these agro-commodities respectively during 2004-2005.

The village level transaction of the agricultural commodities shows that paddy has recorded highest share of marketed surplus in regulated markets. While in the case of vegetables especially onion, they have transacted in largest proportion at village market among different market agencies. Maximum transaction at village level is undertaken especially by the small and marginal farmers, they have very small size of marketable surplus which discourage them to sell their surplus in distant and specialized agricultural markets, to avoid unnecessary transport and time costs. The purchase of agricultural produce by consumers directly from growers/farmers house is another important agency of agricultural marketing channel in which the margin of commission agents to consumers' price is reduced. So, both farmers and consumers get benefited. Besides, time of the consumers (usually agricultural and landless labourers) is saved in which they can earn more wages.

Regulated markets of the study area experience various methods of transaction of agro-commodities. Among those undercover method, open auction method, private negotiation and close tender are important methods of transaction. The undercover method is practiced for foodgrains and vegetables in Chharra regulated market while it is practiced only for foodgrains in Khair

regulated market of the study area. The prevalence of this method in the regulated market shows the level of corruption in these markets. Open auction method of sale is found in Dhanipur in both foodgrains and vegetables, while in Khair, Atrauli and Chharra regulated markets it is found for vegetables only. This system of sale is preferred over all other systems because of the fact that it ensures fair dealing to all parties. Private negotiation of sale is only practice in foodgarins.

There are important functionaries involved in regulated markets such as commission agents, traders, hamals (palledars), warehousemen, brokers, weighmen, surveyers, transport agencies. Their number differs according to the status of the markets. Moreover, in this study various market channels of agro-commodities are also being identified. The commodities are passing through different channels. The channels of agro-commodities are depend upon number of factors like type of the farmers, distance from the mandi, accessibility to the village and seasonality of the produce. Size of the farmer and distance from village to the regulated market are two major factors that determine the channels of agro-commodities.

In the study area four regulated markets are established in different parts of the district. Each market provides many infrastructure facilities to the market users according to the status and degree of transaction of agricultural commodities. The details of infrastructural facilities revealed that Dhanipur market tops among the other markets in respect of amenities and facilities provided to the farmers. Khair market and Chharra market are in the second and third place while Atrauli market is in the last place in terms of provision of amenities and facilities in the market centres. On the whole it can be concluded that no market is able to provide all the listed facilities. Therefore, there is a considerable gap between the desired amenities and amenities actually provided in the market yard.

The present study analyzed the role of regulated markets on agricultural development in Aligarh district. The study area is one of the most fertile parts of Ganga plain where intensity of agriculture is very high. Agro-climatic

conditions are also very favourable for cultivation of various cereal crops i.e., wheat, pulses, oilseeds, as well as some market oriented crops like vegetables and fruits. Analysis shows that food grain is one of the important commodities transected in the markets of Aligarh district, followed by vegetables like potato and onion, oilseeds comes in third position of market arrival, while pulses ranks in the last position of market arrival. Market-wise trend shows that Dhanipur has positive trend of market arrival followed by Khair, Chharra and Atrauli. Location has the direct effect on the size and trend of market arrival.

Dhanipur has highly positive trend in the market arrival of all the commodities. It is because of the biggest consuming center i.e., Aligarh city and being well connected with metalled roads with their market hinterland. It has also a well established service area consisting of 274 villages in its jurisdiction as notified area, that is why Dhanipur market is having the highest market arrival and their trend is positive. Khair is the second most important market as far as market arrivals and their trend is concerned. It is because of big size of land holding and better accessibility around the market hinterland. Chharra and Atrauli regulated markets come in third and fourth positions in their market arrival of agro-commodities. These two markets have low market arrival and also their trend in the arrival of agro-commodities is low. Though the market arrival in these two markets has increased during study period but not very much impressive. On whole it seems that market arrival of agro-commodities has increased many folds but their effect is pronounced specific to commodity and market.

Market arrival shows the extent of regulated market consciousness among the producers. It is an index of the produce's willingness to participate in the regulated market. Market arrival trend of both primary and secondary nature shows that there are wide fluctuations in their arrival of agro-commodities in the regulated markets of the study area. Fluctuation in market arrival trend is due to changes in production pattern around market hinterland. Overall performance of the market arrival trend shows the positive growth of

agro-commodities. Increase in arrival trend is due to increase in the expansion of area under crops as well as number of the farmers coming to the regulated markets in the study area. Thus, increasing trend of market arrival is considered as one of the performance variables of regulated market.

Though the regulated markets in the study area are competitive and integrated but they are not stable in arrival because of seasonal nature of crop production where as their demand is uniform throughout the year. Instability in market arrival has direct effect on price variation. Besides, long run instability on price, variation in agricultural production due to good and bad season also affects the arrival of agro-commodities. Consequently, it has direct effect on the development of agriculture and to the overall development of the area.

However, short-run fluctuations in prices result from uneven supply of the agro-commodities in the market during the year i.e. excess supply at the time of harvest, reduces the supply in the remaining part of the year. These types of the problems emerge due to lack of storage facilities, information and need for the finance on the part of the farmers in the study area. The analysis of the data also reveals that the post harvest period of all the commodities are the supplier of maximum portion of arrival due to emerging need of the farmers for cash to invest in agriculture, to meet socio-economic obligations and repayment of the credits. The flooding of agricultural products in the market, just after the harvesting season is one of major features in the district. This supports the hypothesis that seasonal fluctuations in the arrivals of food grains in the regulated markets are pronounced in the study area.

Spatial pattern of marketed surplus in the regulated market shows that wheat accounts for highest share of 62.46 per cent of total marketed surplus of selected crops. It is followed by potato with 9.71 per cent, paddy 8.07 per cent, mustard 7.85 per cent, *arhar* 6.53 per cent, maize 3.85 per cent, onion 0.91 per cent and moong 0.54 per cent respectively. The difference in the marketed surplus of selected crops in the district is due to the difference in demand and supply of these commodities. Analysis shows that the market centers which are

well connected with roads have higher proportion of marketed surplus. Dhanipur, Khair and Atrauli are the markets which come under this category. Low proportion of marketed surplus of vegetables in Chharra regulated market is because of its interior location.

Moreover, spatially the market centers which are located in the central and western part of the district have higher marketed surplus of agricultural commodities than the market centers located in the eastern part of the district. It is because of well connectivity, big size of land holdings of the farmers, good irrigation facilities and higher productivity in these regions. On the other hand lower productivity in the eastern part is due to the small size of landholdings, problem of electricity and irrigation as well as lesser spatial connectivity among the market hinterland. This supports the hypothesis that 'better spatial integration of market centers at different levels of marketing channels due to efficient transportation and other infrastructural facilities reduces spatial unevenness of marketed surplus'.

The hypothesis that 'as the distance increases, the market arrival intensity declines' does not hold true in every crops and markets. For paddy, market arrival intensity declines in Atrauli and Chharra regulated market but it is not hold true in Dhanipur and Khair regulated markets of the study area. Similarly, maize, *arhar*, groundnut, and *moong* have also registered declining trend of market arrival away from the market. Whereas mustard, potato and onion do not have identical market arrival intensity. The assumption does not hold true in case of wheat, paddy, mustard, potato and onion but for maize, *arhar* and *moong* it proves true. Thus researcher arrived at conclusion, that in a country where farming is the mainstry of the people. The variations in market arrival intensity are related in-direct proportion, other things being equal to variation in distance from market.

Regulated markets of the district have very important role in the marketing of agro-commodities because a large proportion of marketable surplus around the market hinterland are goes to these market centers.

Proportion of market arrival from different zones of the market generally decreases as we moves from the market centers. But it varies market wise and crop-wise. Except Dhanipur all three regulated markets have very much ideal condition in market arrivals from hinterland. It is found that proportion of market arrivals are decreasing in the market. The hypothesis that as the distance increases the proportion of market arrival declines does not hold true in case Dhanipur, but true in Khair, Atrauli and Chharra regulated markets.

Moreover, distance does have a direct bearing on the types of farmers interacting in the regulated markets of the study area. Generally big farmers are coming to the market from far distances but in case of small farmers it is not true. The domination of big farmers/producer seller's coming from fourth and fifth zones is due to their big size of marketable surplus which is economically viable to sell in the sampled market yard as the transport and time cost is distributed in huge weight of surplus and per unit weight transport cost is reduced. Contrary to this the marginal and very small farmers have very small marketable surplus, which is not economically profitable for them to sell in distant regulated markets. Hence the first to third zone is economically favourable for them to come to the regulated mandi and sell their produce in it. They can also save their spare time and utilize them in some economic activities after selling their marketable surplus. The assumption that the farmer's having big size of land holdings even from distant zone will prefer to sell their commodities in the regulated markets without considering the transportation and other cost of marketing, is found to be satisfied in the study area.

Regulated markets are the collection point of agricultural produce therefore it regulates regional development in general and agricultural development in particular. Thus, for the assessment of agricultural development of the study area with reference to regulated markets, there is need to understand the cropping pattern, changing crop combination, ranking of value based crops, growth of area under tillage, changes in the quality of

production and yields, changes in irrigated area, consumption of fertilizers and growth of technological factors.

Cropping pattern in the study area is following with sowing and harvesting season i.e., *Rabi (*58 per cent), *Kharif* (38 per cent)and *Zaid (3.48 per cent)*. Similarly, rank-wise marketed surplus of wheat, *bajra,* maize, paddy, mustard, *arhar*, barley, sugarcane, potato, *moong*, lentil, cotton, peas, gram, onion and groundnut respectively are the leading crops in a descending order.

Cropping pattern of the study area has started to react more vigorously through the impact of markets, the increased socio-economic level of the farmers as well as their interaction to the urban sector and demand and supply of different agricultural commodities. Changes in the level of area, production and yield per hectare of principle crops at district level shows that during study period the net sown area has increased by 1.57 per cent, area sown more than once by 2.90 per cent and the cropped area by 2.05 per cent. Good percentage of increase in area sown more than once indicates that an increase in the cropping intensity of the region. With the growth of irrigation facilities and by the ever-increasing demand for agricultural commodities especially food grains, these type of growth are helpful to develop the agriculture in the study area.

All the cereals like wheat, bajra and paddy except maize and barley have recorded increased production. The increased production of wheat, bajra and paddy vary from 14.51, 31.01 and 176.34 per cent, while decreased production of barley and maize was 39.92 and 44.66 per cent respectively during study period. The largest increase in the yield has been recorded by the cash crop of potato (49.52 per cent), and it is followed by bajra (43.97 per cent), lentil (43.17 per cent), barley (23.85), wheat (20.32 per cent), paddy (16.31 per cent) and sugarcane (3.29 per cent).

With the growing emphasis on commercialization of agriculture by the establishment of agricultural markets in the district, irrigation facilities, fertilizers and other infrastructure facilities constitute important inputs in agricultural operations. Regulated markets are the leading factors towards

development of irrigational facilities in the study area. Nitrogen, phosphorous and potash have increased their share in total consumption of fertilizers in the study area. Moreover, sowing machines and tractor have also increased during the study period.

In the present study market arrival is considered as an independent factor to understand the effect of market on agricultural development. The agricultural variables like production, yield, cropped area, irrigated area, fertilizer consumption, tractors, price of commodities, storage facilities, cropping intensity etc. have been taken as dependent variables. Karl Pearson's coefficient of correlation technique has been used to understand the causal relationship between the variables of regulated market and agricultural development for two different periods, viz. 1991-92 and 2002-2003.

It has been observed that inter correlation between the different variables of regulated markets and agricultural developments are strongly correlating during study period. Therefore, it may be concluded that with the passage of time inter correlation between different variables of regulated markets and agricultural development are increasing. Increasing correlation between different variables indicates that regulated markets have important role in agricultural development of the district Aligarh. Thus it supports the hypothesis that there is positive relation between regulated market and agricultural development in the study area.

Thus as a generalized statement it can be argued that regulated markets are playing a very significant role in the transaction of agricultural commodities as well as commercialization of agriculture. The flow of goods in the regulated markets takes place through different channels and their flow is determined by the number of factors like type of the farmers, distance from the market, accessibility to the village and seasonality of the produce. Trend of primary arrival shows that the production of all selected commodities is increasing because regulated markets providing necessary infrastructural facilities, market information, good price structure, all necessary inputs such as fertilizers and seeds etc., which encourage the producer farmers around market

hinterland to grow their crops on commercial level over the years, thus expanding the catchmnent area of regulated market. Moreover, regulated markets of the district have close relationship with agricultural development.

. It is now commonly believed that the improved marketing facilities contribute to the agricultural development by encouraging magnitude of production. Actual loss of products is caused by the inefficiencies in their movement from the farmers to the consumers, passing through various phases like, processing, storing and transportation of the agricultural products. The variation in the storage costs and loses are very high. Transportation and handling losses also vary with the nature of crop and technique of marketing. The presence of various undesirable market charges, methods of transaction and the exploitative behaviour of the traders contribute to higher marketing costs.

Suggestions

Thus, the present study suggest that in order to promote the agricultural development in the study area following measures should be applied to the marketing of agro-commodities in the regulated markets of the study area.

Firstly, during the peak season after harvest, the arrivals are more, within a short period it is not possible to auction off every lot. Therefore, farmers have to wait for seven to ten days for their turn. This type of problem is prevailing in all regulated markets of the study area. This type of situation during the post harvest period of two to three months creates congestion in the market yard. Thus there should be proper arrangements of stay in all the regulated markets for the farmers.

Until the produce is sold, the farmers have to stay at the commission agents shop to ensure that there are no losses due to pilferage, damage etc. Pilferage in small quantities is common in market which is done by the market labor class. It is observed during the field survey that in Chharra market weighing is done only 50 kg in one lot and they weigh their commodities in cloths not in a gunny bag. Therefore in every lot of weigh farmers have to give

extra one to two kilograms. Moreover, *khonchi*[1] system is found in all the regulated markets of the study area. The cases of occasional theft are also not uncommon in the markets in absence of guard and proper check-posts.

Secondly, as per the State Marketing Act, all unauthorized deductions were banned. The charges for each marketing activity had also been fixed but in practice these are still found in all the regulated markets of the district. There is a practice among agents to take a sample from farmers' produce. The quantity of such samples varies from 200 grams to one kilogram and since in case such samples are taken by several traders, it turns into a net loss to the farmer. There are so many charges which have been taken from the producer and farmers such as commission, brokerage, weighment, loading, impurity charges, excessive moisture charges etc. As a result, the marketing cost of produce goes up and that too at the cost of farmer's money. Therefore there is an urgent need of market committee to check the exploitation of farmers for proper implementation of market regulation.

Thirdly, there are many methods of sale in different markets. Even in the same market, different methods are followed for different commodities. Undercover method is in practice for food grains in Chharra and Khair regulated market. Open auction method should be prevailed in all the regulated markets for all the commodities while it is practiced in Dhanipur for vegetables and food grains only. However, in Khair, Chharra and Atrauli it is practiced only for vegetables. The prevalence of under cover and negotiation methods in the regulated market shows the level of corruption because the establishment of regulated markets is to save producers from all the prevalent malpractices. Therefore there is a need to strictly apply the method of auctioning for the sale of agro-commodities by the market committee.

Apart from the above mentioned problems of the farmers in the regulated markets, there are also other difficulties such as bank, post office, delay payment (in case of large marketable surplus), grading facilities, adequate market intelligence, financial problems etc. The main reason of

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1 A kind of service charges deduced from producers agro-commodities

farmer's exploitation in agricultural markets is their illiteracy and lack of organization. They are scattered over a large area with no common organization to guide and to protect their interests.

In adequate transportation, storage, costly labour, interference of mandi officials is the main problems which are faced by the traders also in regulated markets of the study area. Apart from these problems multiplicity of taxes creates harassment for them. They want to combine both sale tax and income tax for their convenience.

If the farmers secure fair prices for their produce, market information made available to him at the proper time, industries secure steady and reliable supply of raw materials of good quality, the problems mentioned above in marketing of agricultural produce can be solved. For streamlining the agricultural marketing in Aligarh, all efforts by government and allied marketing agencies should be directed to solve the prevalent problems and also a planned strategy should be prepared for future development of regulated markets and its effects on agricultural development in the district.

GLOSSARY

GLOSSARY

Local Words	English Equivalents
Adhiniyam	Act
Arhar	Pigeon pea
Arhatiya	Commission agents in agricultural markets playing middlemen role
Babul	Acacia
Barley	Hordeum bulgare
Bajra	Pearl millet
Bhanger	Old alluvium
Block	Administrative division of tehsil
Doab	Inter-reverine plain
Dalal	Broker
Dhoti	kind of cloth worn by Indian male
Ghee	Clarified butter
Gur	A form of crude sugar
Hamal (Palledar)	The person appointed for processing, cleaning, sieving of agro. commodities
Jhil	Lake
Jute	Corchores capsularis
Jwar	Green millet
Khadar	New alluvium
Kharif	Summer season crop
Katcha Arhatiya	Commission agent who assembles agricultural products in regulated markets
Khonchi	A kind of service charges deduced from producers agro. commodities
Masur	Lentil
Mandi	Regulated market
Methi	Trigonella foenum graecum
Moong	Green gram
Pepal	Banyan
Pucca Arhatiya	Commission agent who purchases commodities from farmers in regulated markets through katcha arhatiya
Rabi	Winter season crop
Reh	Salt efflorescence, alkaline soil
Shakkar	Sugar
Tehsil	Administrative division of district
Urd	Black gram
Zaid	Rainy season crop

APPENDICES

Appendix-I

Questionnaire for Traders/agents

1. Name 2. Age 3. Sex. M/F

4. Religion 5. Education- illiterate/primary/secondary/above

6. Trader/commission agent or both

7. Place of origin/distance

8. Size of land holding

(a) Landless /below 1 acre (b) 1-5 acres

(c) 5-10 acres (d) 10-15 acres (e) above 15 acres

9. Location of shops in market/ outside market

10. Commodities of trade

S.No.	Commodities	Quantity	Purchase price
1.			
2.			
3.			

11. Weather regulated marketing is beneficial to you; if yes then what are the benefits in terms of

(a) Disposal of products

(b) Payment to Farmers

(c) Quality of products

(4) Facilities available at market

(a) Space for disposal of products (b) Storage

(c) Banking (d) Post office (e) Insurance

12. Rate of commission per 100 Rupees

Arhatiya	Broker	Market fee	Storage	Others

13. Weather they have their union, if yes what is its role

14. Their relations with *mandi* official –cordial/non cordial

15. Nature of help they provide to farmers

(a) In disposal of products (b) In payment (c) In providing loans

16. What are the problems of marketing?

(a)

(b)

(c)

17. Suggestions for the improvement of marketing facilities

Appendix-II

Questionnaire for Producer/Farmer/Sellers

1. Name 2. Age 3. Sex

4. Religion 5. Education-illiterate/primary/secondary/above

6. Type of sellers- producer sellers/traders-full time, part time/village merchants/itinerant traders

7. Place of origin/village/distance from market

8. Size of land holdings

(a) Landless below 1 acre (b) 1-5 acres

(c) 5-10 acres (d) 10-15 acres (e) above 15 acres

9. Commodities brought by him and purchase price

S.No.	Product	Quantity	Own/purchased	Purchased Costs	Selling Costs	Transport Costs	Other Costs	Total

10. Mode of transport and cost

Tractor/truck/bullock-camel cart/rickshaw/three wheelers/others

11. Connected-metal/unmetelled road/cart track

12. What are the benefits of regulated markets?

(a) In disposal of products

(b) In terms of price of the products

(c) In terms of payment-weather payment received on the spot/through agents afterwards.

13. Rate of taxes paid by you per 100 Rupees

Arhatiya	Broker	Market fee	Storage	Others

14. Problems- (Marketing and yard)

(Mention the problems in marketing)

(a) Transportation problem (b) Grading problem

(c) Payment problem (d) Problems at market yard

(i) Stay (ii) Parking of vehicles (iii) Drinking water (iv) Cattle shed (v) Theft (vi) Banking (vii) Stray cattle's

15. Suggestion for the improvements in marketing facilities

16. Farmers preference for regulated markets

(a) For good prices (b) Better marketing facilities

(c) Immediate payment (d) Official control.

Appendix-III

Questionnaire for the Village Producer Farmer

1. Name 2. Age 3. Sex

4. Religion

5. Size of land holdings

(a) Landless below 1 acre (b) 1-5 acres

(c) 5-10 acres (d) 10-15 acres (e) above 15 acres

6. Types of crops grown and place of sale for agro-commodities

Agro-commodities	Villages	Regulated Market	Rural Market	Others	Price of Sale	Other Costs

7. Why farmers prefer to sell their agro- commodities in the regulated markets

(a)

(b)

(c)

8. Why farmers prefer to sell their agro- commodities to traders

(a)

(b)

(c)

9. Why farmers want to sell their produce at the farm gate or in village

(a)

(b)

(c)

10. Farmers participation in trading

(a) Weather he is active

(b) Occasionally active

(c) No participation

Appendix-IV
Block-wise Area of Different Crops in Aligarh District 1991-92

S N	Blocks	Wheat	Bajra	Paddy	Maize	Barley	Mustered	Arhar	Moong	Peas	Gram	Lentil	Potato	Onion	Total
1	Tappal	18916 (47 91)	4789 (12 13)	607 (1 54)	4076 (10 32)	2408 (6 10)	4775 (12 09)	1590 (4 03)	442 (1 12)	818 (2 07)	450 (1 14)	87 (0 22)	260 (0 66)	2 (0 005)	39480 (100)
2	Chanduas	14910 (42 49)	4442 (12 66)	498 (1 42)	3707 (10 56)	2736 (7 80)	4950 (14 11)	1670 (4 76)	385 (1 10)	900 (2 56)	360 (1 03)	85 (0 24)	220 (0 63)	6 (0 017)	35089 (100)
3	Khair	17807 (49 01)	4714 (12 97)	241 (0 66)	3025 (8 33)	2706 (7 45)	4195 (11 55)	1345 (3 70)	565 (1 56)	750 (2 06)	305 (0 84)	65 (0 18)	303 (0 83)	8 (0 002)	36332 (100)
4	Jawan	12147 (35 81)	6739 (19 87)	820 (2 42)	5488 (16 18)	1887 (5 56)	3320 (9 79)	1440 (4 25)	1082 (3 19)	220 (0 65)	255 (0 75)	80 (0 24)	220 (0 65)	2 (0 006)	33920 (100)
5	Lodha	8977 (31 47)	5514 (19 33)	391 (1 37)	2450 (8 59)	2526 (8 86)	4800 (16 83)	1685 (5 91)	503 (1 76)	570 (2 00)	370 (1 30)	109 (0 38)	315 (1 10)	1 (0 004)	28526 (100)
6	Dhanipur	13066 (37 75)	4990 (14 42)	721 (2 08)	4005 (11 57)	1794 (5 18)	5500 (15 89)	1895 (5 47)	914 (2 64)	765 (2 21)	389 (1 12)	92 (0 27)	241 (0 70)	2 (0 006)	34615 (100)
7	Gonda	14579 (46 43)	5458 (17 38)	487 (1 55)	1511 (4 81)	2433 (7 75)	4315 (13 74)	800 (2 55)	630 (2 01)	350 (1 11)	305 (0 97)	97 (0 31)	215 (0 68)	6 (0 019)	31401 (100)
8	Iglas	12589 (45 44)	5044 (18 20)	250 (0 90)	520 (1 88)	2390 (8 63)	4020 (14 51)	980 (3 54)	460 (1 66)	300 (1 08)	390 (1 41)	150 (0 54)	305 (1 10)	4 (0 014)	27707 (100)
9	Atrauli	12837 (33 93)	6544 (17 30)	515 (1 36)	5845 (15 45)	2774 (7 33)	4900 (12 95)	1250 (3 30)	569 (1 50)	942 (2 49)	445 (1 18)	257 (0 68)	475 (1 26)	6 (0 016)	37834 (100)
10	Bijauli	10533 (34 06)	5194 (16 80)	371 (1 20)	4139 (13 38)	1979 (6 40)	4824 (15 60)	1665 (5 38)	369 (1 19)	820 (2 65)	290 (0 94)	248 (0 80)	245 (0 79)	01 (0 003)	30923 (100)
11	Gangeri	17028 (44 64)	3193 (8 37)	427 (1 12)	5678 (14 89)	2997 (7 86)	3025 (7 93)	1480 (3 88)	2174 (5 70)	924 (2 42)	455 (1 19)	227 (0 60)	265 (0 69)	4 (0 010)	38142 (100)
12	Akrabad	13499 (40 71)	4194 (12 65)	1073 (3 24)	3298 (9 94)	1753 (5 29)	4113 (12 40)	1245 (3 75)	2290 (6 91)	850 (2 56)	330 (1 00)	60 (0 18)	225 (0 68)	8 (0 024)	33163 (100)
	Total Rural	166888 (40 99)	60815 (14 94)	6401 (1 57)	43742 (10 74)	28383 (6 97)	52737 (12 95)	17045 (4 19)	10383 (2 55)	8206 (2 02)	4344 (1 07)	1557 (0 38)	3289 (0 81)	50 (0 012)	407129 (100)
	Urban	210 (14 08)	29 (1 95)	55 (3 69)	155 (10 40)	53 (3 55)	50 (3 35)	190 (12 74)	43 (2 88)	50 (3 35)	40 (2 68)	30 (2 01)	283 (18 98)	20 (1 341)	1491 (100)
	District Total	167098 (40 89)	60844 (14 89)	6456 (1 58)	43897 (10 74)	28436 (6 96)	52787 (12 92)	17235 (4 22)	10426 (2 55)	8256 (2 02)	4384 (1 07)	1587 (0 39)	3572 (0 87)	70 (0 017)	408620 (100)

Source Statistical Magazine District Aligarh 1993 pp-42- 43 45- 46 49 51 52 Note Area in Hectares Figure in Bracket Shows their Percentage

Appendix-V

Block-wise Area of Different Crops in Aligarh District 2002-2003

S. N	Blocks	Wheat	Bajra	Paddy	Maize	Barley	Mustered	Arhar	Moong	Peas	Gram	Lentile	Potato	Onion	Total
1	Tappal	22859 (59 20)	4481 (11 61)	3488 (9 03)	1254 (3 25)	1161 (3 01)	3234 (8 38)	1708 (4 42)	73 (0 19)	34 (0 09)	32 (0 08)	65 (0 17)	215 (0 56)	6 (0 02)	38610 (100)
2	Chanduas	20088 (54 49)	4946 (13 42)	1505 (4 08)	2190 (5 94)	1837 (4 98)	2828 (7 67)	2719 (7 38)	288 (0 78)	18 (0 05)	108 (0 29)	114 (0 31)	220 (0 60)	5 (0 01)	36866 (100)
3	Khair	2499 (12 42)	6936 (34 46)	2290 (11 38)	842 (4 18)	2084 (10 35)	2511 (12 48)	1982 (9 85)	122 (0 61)	54 (0 27)	38 (0 19)	59 (0 29)	702 (3 49)	7 (0 03)	20126 (100)
4	Jawan	16444 (51 57)	2951 (9 25)	3389 (10 63)	3965 (12 43)	981 (3 08)	1243 (3 90)	1984 (6 22)	429 (1 35)	43 (0 13)	69 (0 22)	167 (0 52)	221 (0 69)	3 (0 01)	31889 (100)
5	Lodha	14875 (49 50)	6192 (20 60)	995 (3 31)	1212 (4 03)	1648 (5 48)	2027 (6 74)	2052 (6 83)	188 (0 63)	206 (0 69)	99 (0 33)	158 (0 53)	398 (1 32)	3 (0 01)	30053 (100)
6	Dhanipur	15774 (49 35)	3703 (11 58)	4220 (13 20)	2619 (8 19)	1028 (3 22)	1834 (5 74)	1519 (4 75)	647 (2 02)	81 (0 25)	63 (0 20)	120 (0 38)	351 (1 10)	5 (0 02)	31964 (100)
7	Gonda	18845 (54 91)	8453 (24 63)	1355 (3 95)	276 (0 80)	1486 (4 33)	1762 (5 13)	757 (2 21)	116 (0 34)	3 (0 01)	17 (0 05)	25 (0 07)	1215 (3 54)	10 (0 03)	34320 (100)
8	Iglas	14278 (46 45)	8428 (27 42)	629 (2 05)	246 (0 80)	1092 (3 55)	1189 (3 87)	969 (3 15)	48 (0 16)	15 (0 05)	17 (0 06)	50 (0 16)	3772 (12 27)	6 (0 02)	30739 (100)
9	Atrauli	17038 (46 29)	5698 (15 48)	2311 (6 28)	5255 (14 28)	1939 (5 27)	1538 (4 18)	1713 (4 65)	245 (0 67)	-	112 (0 30)	379 (1 03)	564 (1 53)	14 (0 04)	36806 (100)
10	Bijauli	13708 (51 63)	6876 (25 90)	302 (1 14)	2043 (7 69)	1332 (5 02)	818 (3 08)	987 (3 72)	21 (0 08)	-	25 (0 09)	220 (0 83)	217 (0 82)	1 (0 004)	26550 (100)
11	Gangeri	19885 (46 04)	12695 (29 39)	226 (0 52)	3314 (7 67)	2764 (6 40)	1567 (3 63)	1318 (3 05)	225 (0 52)	-	106 (0 25)	705 (1 63)	378 (0 88)	5 (0 01)	43188 (100)
12	Akrabad	15114 (49 28)	3791 (12 36)	4690 (15 29)	2325 (7 58)	1164 (3 80)	1191 (3 88)	814 (2 65)	810 (2 64)	337 (1 10)	84 (0 27)	163 (0 53)	177 (0 58)	11 (0 04)	30671 (100)
	Total Rural	210107 (51 69)	75150 (18 49)	25497 (6 27)	25541 (6 28)	18516 (4 56)	21742 (5 35)	18522 (4 56)	3212 (0 79)	791 (0 19)	770 (0 19)	2225 (0 55)	4330 (1 07)	76 (0 02)	406479 (100)
	Urban	2349 (43 96)	525 (9 83)	620 (11 60)	779 (14 58)	187 (3 50)	142 (2 66)	254 (4 75)	200 (3 74)	13 (0 24)	2 (0 04)	8 (0 15)	237 (4 44)	27 (0 51)	5343 (100)
	District Total	212456 (51 08)	75675 (18 19)	26117 (6 28)	26320 (6 33)	18703 (4 50)	21884 (5 26)	18776 (4 51)	3412 (0 82)	804 (0 19)	772 (0 19)	2233 (0 54)	8667 (2 08)	103 (0 02)	415922 (100)

Source- Statistical Magazine District Aligarh 2004 pp-37-39 42-48 *Note- Area in Hectares Figure in Bracket Shows their Percentage*

Appendix-VI

Block-wise Distribution of Total Cropped Area, Net Sown Area and Area Sown more than once

S N	Blocks	Total Cropped Area			Net Sown Area			Area Sown More than once		
		1991-92	1996-97	2002-03	1991-92	1996-97	2002-03	1991-92	1996-97	2002-03
1	Tappal	43712	47453	46285	30599	31580	31931	13113	15873	14354
2	Chanduas	38907	44132	43094	26931	26349	27953	11976	17783	15141
3	Khair	40108	42248	44711	27213	27309	28951	12895	14939	15760
4	Jawan	37959	40307	38574	21574	22588	23169	16385	17719	1545
5	Lodha	37436	36183	34423	23846	22019	21719	13590	14164	12704
6	Dhanipur	38230	41974	38583	22395	21320	23314	15835	20654	15269
7	Gonda	35686	37262	37669	25074	25003	25209	10612	12259	12460
8	Iglas	30834	35182	33503	22639	22153	22003	8195	13029	11500
9	Atrauli	41196	43581	42377	23982	24051	24659	17214	19530	17718
10	Bijauli	35973	35610	29611	23128	18696	19032	12845	16914	10579
11	Gangeri	48520	50215	48006	28260	28418	29286	20260	21797	18720
12	Akrabad	36085	42493	34136	19451	22184	21176	16634	20309	12960
Total Rural		464646	496640	470972	295092	291670	298402	169554	204970	172570
Urban		3566	1462	6880	1992	1056	3349	1574	406	3531
District Total		468212	498102	477852	297084	292726	301751	171128	20536	176101

Source- Statistical Magazine, District Aligarh ,

Appendix-VII

Block-wise Distribution of Consumption of Fertilizers in Aligarh District

S N	Blocks	Nitrogen			Phosphorus			Potash			Total Fertilizers		
		1991-92	2003-03	Growth in %	1991-92	2003-03	Growth in %	1991-92	2003-03	Growth in %	1991-92	2003-03	Growth in %
1	Tappal	1715	2567	49 67	850	1594	87 52	30	123	310	2595	4284	65 08
2	Chanduas	2272	2566	12 94	1000	1529	52 9	42	115	173 8	3314	4210	27 03
3	Khair	2263	2564	1330	935	1524	62 99	30	116	286 6	3228	4204	30 23
4	Jawan	2009	2564	27 62	862	1524	76 79	40	120	200	2911	4208	44 55
5	Lodha	2128	2566	20 58	650	1533	135 84	55	123	123 63	2833	4222	28 95
6	Dhanipur	3062	2566	-16 19	945	1528	61 69	30	115	283 33	4037	4209	4 26
7	Gonda	1775	2555	43 94	802	1527	90 39	70	105	50	2647	4187	58 17
8	Iglas	1844	2573	39 53	800	1540	92 5	70	120	71042	2714	4233	55 96
9	Atrauli	2370	2570	8 43	924	1537	66 34	44	112	154 54	3338	4119	26 39
10	Bijauli	892	2566	187 6	336	1538	357 7	03	120	3900	1231	4224	243 1
11	Gangeri	2287	2568	12 28	789	1467	85 93	35	115	228 57	3111	4150	33 39
12	Akrabad	1708	2572	50 58	520	1496	187 69	38	114	200	2266	4182	84 55
District Total		24325	30797	26 60	9413	18337	94 80	487	1398	187 06	34225	50532	47 64

Source- Statistical Magazine, District Aligarh,

BIBLIOGRAPHY

BIBLIOGRAPHY

BOOKS

Acharya, S.S.and Agarwal, N.L. (1987), *Agricultural Marketing in India,* Oxford and IBH Publishing Company, Delhi.

Adam, J. (1680), An Alphabetical List of All Cities, Market, Towns, Parishes, Villages, and Private Seats in England and Wales, London.

Agarwal, N.L. (1986), *Agricultural Prices and Marketing in India*, Mittal Publication, Delhi.

Amarchand, D.and Varadharajan, B. (1980), *An Introduction to Marketing*, Vikas Publishing House Private Ltd., New Delhi.

Applebaum, W. (1954), Marketing Geography, in James, P.E. and Jones, C.F. (ed). *American Geography: Inventory and Prospects*, Syracus.

Arya, A. (1993), *Agricultural Marketing in Gujarat*, Concept Publishing Company, New Delhi.

Balshaw, C.S.(1965), *Traditional Exchange and Modern Markets*, Prentice Hall of India, New Delhi.

Bauer, P.T .(1976), State Control of Marketing in Developing Countries, p.30-34, in Izraeli et al (ed). *Agricultural Marketing for Developing Countries,* INCOMAS, Vol.II, John Wiley, New York.

Bedekar, S.L. (1972), *Role of Regulated Markets in the Development of Rural Areas* in N.C.A.E.R. Market Towns and Spatial Development, New Delhi.

Berry, B.J.L.(1967), *Geography of Market Centres and Retail* Distribution, Prentice Hall.

Bidikar, A.S. (2002), *Spatial Analysis of Market Centres in Drought Prone Areas : A Case Study of Bijapur District*, unpublished thesis submitted to Karnatka University, Dharwad.

Bromely, R.J. (1974), *Periodic Markets, Daily Markets and Fairs: A Bibliography*, No.10, Melbourne.

Brookfield, H. (1975) , *Independent Development*, Methuen, London.

Brunk, M.E. and Darrah, L.B. (1955), *Marketing of Agricultural Products,* The Ronald Press Company, New York.

Burrad, S.S (1915), Origin of the Gangetic Trough Commonly Called the Himalayan Force-Deep, Proceeding Royal Society London, Vol. 220-238.

Chauhan, P.R and Sing, R.S (1999), *Regulated Agricultural Markets and Rural Development: A Case Study of Eastern Uttar Pradesh,* in Commercial Activities and Development in the Ganga Basin, (ed) V.K. Srivastava, Concept Publishing Company, New Delhi, pp. 257-268.

Christaller, W. (1966), *Central Place in Southern Germany,* Translated from German (1933) into English by Baskin, C.W., New Jersey.

Cleef, E.V. (1937), *Trade Centres and Trade Routes,* D. Appleton-Century Co. New York.

Cumming (Jr.) R.W. (1969), *Pricing Efficiency in the Indian Wheat Market,* Impex India, New Delhi.

Dantwala, M.L. (1961), *India's Food Problem,* Asia Publishing House. Bombay.

Dixit, R.S. (1984), *Market Centres and their Spatial Development in the Umland of Kanpur*, Kitab Mahal, Allahabad.

Frankel, F.R. (1971), *India's Green Revolution, Princeton,* University Press. Bombay.

Garewal, S.S and Johl (1970), *Marketing of Maize in Punjab,* Department of Economics and Sociology, Punjab Agricultural University, Ludhiana.

Garnier, B. J and Delobez,, A. (1979), *Geography of Marketing*, Longman.

Gopal, R. (2001), *Rural Marketing Development*, Policy, Planning and Practice, Rawat Publication, New Delhi.

Govind, N. (1986), *Regional Perspectives in Agricultural Development*, Concept Publishing Company, New Delhi.

Gupta, A.P. (1975), *Marketing of Agricultural Produce in India*, Vora and Co. Publishers Pvt. Limited, Bombay.

Harriss, B. (1983), *State and Market*, Concept Publishing Company, New Delhi.

Harriss, B.(1985), *Markets and Inter-Sectoral Resource Transfer*, Proceedings of the inst. Workshop on Agi Marketing in Semi-arid Tropics.

Harriss, B. (1985), *How to Study Agricultural Marketing and How Not to Study it*, working paper No.7, Madras Inst of Dev. Studies.

Henery, K. (1954), *Food Administration in India*, Stand Ford University, California.

Hoda, M.M (2006), *Agricultural Marketing in Backward Regions-* A Case Study, Rajat Publication, New Delhi.

Hodder, B.W. and Lee, Rojer. (1974), *Economic Geography*, Methuen, London.

Hunter, G. (1969), *Modernizing Peasant Societies*, Oxford University Press, London.

Hussain, M.M.(1986), *Agricultural Geography*, Anmol Publications Pvt. Ltd, New Delhi.

Hussain, M.M.(2003), *Role of Ecological Factors in the Agricultural Development of North Bihar Plain,* unpublished thesis, Department of Geography, A.M.U.Aligarh.

Ibrahim, R.(1984), *Market Centers and Regional Development*, B.R Publishing Corporation. Delhi.

Izraili, D., Izraeli, D.N. and Meissner, F. (eds) (1976), *Agricultural Marketing in Developing Countries*, INCOMES Proceedings, Vol. I and II, John Wiley, New York.

Jain, C.K and Jain, A.K (1999), *Commercialization of Agriculture and its Relation with Economic Development in the Ganga Basin of Madhya Pradesh,* in Shrivastav,V.K ed. 'Commercial Activities and Development in the Ganga Basin', Concept Publishing Company, New Delhi, pp.120-133.

Jain, S.C.(1971), *Principles and Practice of Agricultural Marketing* and Prices, Vora and Co. Publishers Pvt. Limited, Bombay.

Joshi, V.R.(1966), *Regulated Markets in Gujarat*, Ph.D. Thesis, Sardar Patel University, Vallabh Vidya Nagar.

Kahlon, A.S. (1970), *Impact of Changing Conditions on Grain Marketing Institutions and the Structure of Grain Markets in Punjab*, Punjab Agricultural University, Ludhiana.

Kahlon, A.S and George, M.V. (1985), *Agricultural Marketing and Price Policies*, Allied Publishers, Delhi.

Kanwar, J.S. (1968) *Cropping Patterns, Scope and Concepts,* Proceedings of the Symposium on Cropping Pattern India, ICAR.

Khan, N. (1999), *Role of Periodic Markets in Agricultural Marketing in North India- A Case Study of Faizabad District* in Srivastava V.K. (ed), Commercial Activities and Development in Ganga Basin, Concept Publishing Company, New Delhi.

Khan, N. (1991), *Agricultural Development and Marketing*, H.K, Publisher and Distributors. Delhi

Khols, R.L. (1967), *Marketing of Agricultural Products*, 3rd Ed, Machmillan, London.

Kohls, R.L. *et al* (1980), *Marketing of Agricultural Products*, Macmillan Publishing Company Inc. New York, 5th Edition.

Khusro, A.M. (1969), *The Economics of Buffer Stocks and Storage of Major Food Grains in India*, Institute of Economic Growth, Delhi.

Kotler, P. (1972), *Marketing Management Analysis*, Planning and Control, Prentice Hall of India Pvt. Ltd., New Delhi.

Krishna, G. (1992), The Concept of Agricultural Development in Mohammad, N (ed.), Dynamics of Agricultural Development, Concept Publishing Company, Delhi Vol.7, pp.29-36.

Kulkarni, B.D. (1977), *Functioning of Regulated Markets in Sholapur District with Special Reference to Groundnut, and Bajra,* Ph.D. Thesis, Shivaji University.

Larson, A.L. (1957), *Agricultural Marketing*, Prentice Hall of India. New Delhi.

Lele, J. U. (1968), *Working of Grain Markets in States of India*, USAID Research Project, Cornel University.

Lele, J.U (1971), Foodgrain Marketing in India, Cornell University Press, Ithaca.

London, P. (1975), *Merchant as a Promoters of Rural Development: An Indian Case Study*, Praeger, New York.

Long, M. (1977), *An Introduction to the Sociology of Rural Development,* Tavistock, London.

Lorenzl, G. (1978), *Agricultural and Food Marketing in Soci-economic Development*-A working paper, German Foundation For International Development, Burlin

Losh, A (1954), Dierauliche Ording Deriwins Witschaly, Jena Fischer, Trans By Woglom, W.H and Stopler, W.F., The Economics of Location, New Haven Yale University.

Mallick, S.C. (1976), *Marketing of Rice in Orissa*, Ph.D. Thesis, Orissa University of Agriculture and Technology.

Mathur, B.S. (1971), *Cooperatives in India*, Sahitia Bhavan, Allahabad.

Mohammad, N (1981), Technological Change and Diffusion of Agricultural Innovation, Perspective in Agricultural Geography, Concept Publishing Company, New Delhi, Vol. IV,

Mulvihil Moyer, R & Hollander, S.C (eds) (1968), *Markets and Marketing in Developing Economics*, Ricgard D.Irwin, Homewood, Illinois.

Murthy, N. G. (1988), *Regulated Market in a Rural Economy*, Ajanta Publications, Delhi.

Newman, W. H. (1950), *Administrative Action,* Prentice Hall Inc., Englewood Cliffs N.J., New York.

Prasad, A.S.(1985), *Agricultural Marketing as a Focal Point of Economic Development- A Case Study of Mohibullapur Mandi*, Lucknow in Shrivastava V.K. (editor), Commercial Activities and Development in Ganga Basin, Concept Publishing Company, New Delhi.

Prasad, J.(1991), *Marketable Surplus and Market Performance*, Mittal Publication, Delhi.

Prasad, K.N. (1998), *Dimensions of Development Analysis of an Underdeveloped State,* Concept Publishing Company, New Delhi.

Radhakrishnan, V. (1971), *Marketing of Cash Crops: With Special Reference to Groundnut and Cotton in Khandesh Region*, Ph.D. Thesis, University of Bombay.

Rajgopal, (1986). *Dynamics of Agricultural Marketing in India*, Rainbow Publications, Coimbatore.

Rajgopal, (1988), *Micro-Level Planning for Agricultural Marketing*, Renaissance Publication, Delhi.

Rajpati, R (1989), *Agricultural Development and Planning in India,* Criterion Publications, New Delhi.

Riley, H.M and Webex, M.T. (1979), *Food and Agricultural Marketing in Developing Countries*-An Annotated Bibliography of Doctoral Research in Social Sciences, 1969-79, Department of Agricultural Economics, Michigan State University.

Sami, A. (1980), *Intra-Urban Market Geography*, Concept Publication, New Delhi.

Saxena, H.M. (1972), *Regulated Agricultural Markets*, Rawat Publications, Jaipur.

Saxena, H.M. (1990), *Marketing Geography*, Rawat Publications, Jaipur.

Saxena, H.M. (1992), *Regulated Agricultural Markets- A Case Study* of Rajasthan, Rawat Publication.

Saxena, H.M. (2003), *Marketing Behaviour: A Regional Analysis*, R.B.S.A. Publishers, Jaipur.

Saxena, H.M (2004), *Marketing Geography,* Rawat Publication, Jaipur.

Saxena, P. (2003), *Marketing and Sustainable Development*, Rawat Publications, Jaipur.

Sharma, S.K. and Archana, B .(1998), *The Study of Transport Facilities and Market Centres in Madhya Pradesh*, in B.C. Vaidya, (editor), Readings in Transport Geography: A Regional Perspective, Delhi: Devika Publication.

Srivastava, V.K.,(1971), *Agricultural Markets of Uttar Pradesh*, in Noor Mohammad (eds), Perspective in Agriculture Geography, Vol.III, New Delhi.

Srivastava, V.K. (1988), Commercial Activities and Rural Development in South Asia: A Geographical Approach, Concept Publication, New Delhi.

Singh, G.N. *et. al.* (1987), *Agricultural Marketing in India*, Chugh Publications, Allahabad, India.

Singh, K.N. (1962), *Rural Markets and Urban Centres in Eastern U.P, Geographical Analysis,* Unpublished Ph.D. Thesis, B.H.U., Geography Department.

Singh, L.P. (1983), *Regulated Markets in India*, Capital Publishers, Delhi.

Singh, L.P. (1995), Regulated Markets: Shortcomings and Correctives in Indian Agricultural Marketing Emerging Trends and Prospects, ed. Jagdish, P and Aravind, P. Mittal Publication, New Delhi.

Singh, R.L (1971), India : *A Regional Geography,* National Geographical Society of India, Varanasi .

Sinha, G.N. (1956), An Introduction to Food Economics, Allahabad.

Sinha, S.P . and Verma, B. N., (1974) *A Study of Marketable Surplus, Marketing Costs and Margins of Foodgrains in North Bihar,* University of Bihar.

Sivarama Prasad, A. (1982), Managements of Regulated Markets: A Study of Organizational Performance of Selected Regulated Markets in Andhra Pradesh, Ph.D Thesis, Andhra University.

Sivarama Prasad, A. (1985), *Agricultural Marketing in India*, Mittal Publications, Delhi.

Smith, Carol. A. (1976), *Regional Analysis*, Vol.I Economic System, Academic Press, New York.

Smith, R.H.T. (1972), The Synchronization of Periodic Market in W.P. Adams and F.M. Halleiner (eds), *International Geography,* Toronto, Vol, pp. 591-93.

Subba Rao, K. (1978), *Rice Marketing System and Compulsory Levies in Andhra Pradesh*, Allied Publishers Private Limited, Bombay.

Suodgrass, Milton M, and Wallace, L.T. (1982), *Agriculture Economics and Resource Management*, Prentice Hall of India.

Taori, K. (2003), *Marketing the Unorganised Sector*, Concept Publishing Company, New Delhi.

Thakur, A (1992), Patterns of Agricultural Growth in Noor, M (ed.), Dynamics of Agricultural Development, Concept Publishing Company, New Delhi, Vol.7.

Upender, M(1990), *Marketable and Marketed Surplus in Agriculture*, Mittal Publication, Delhi.

Vance, J.E. (1970), *The Merchant's World: The Geography of Wholesaling*, Prentice-Hall.

Yasin, G. (1976), *Marketing of Agricultural Products in Punjab*, Punjab Board of Economic Inequality, Lahore.

Zaibun, Y. Jasdanwalla. (1966), *Marketing Efficiency in Indian Agriculture*, Allied Publishers, Bombay.

JOURNALS

Ahmad, R. (2000), Management of Indian Agricultural Marketing Cooperatives in Changing Economic Environment, *Asian Profile*, Vol. 28, No. 5, pp. 411-420.

Amani,K.Z and Khan, N. (1989), Agricultural Marketing in Uttar Pradesh, *The Geographer*, Vol .XXXVI, No.2, pp-7-17.

Amani,K.Z.and Khan, N. (1993), Spatial Behaviour of Consumers and Traders in Periodic Markets in a North Indian State : A Case Study, *Asian Profile*, Vol, 21. No,3, p-245.

Ambrose, P.J. (1968), An Analysis of Intra-urban Shopping Pattern, *Town Planning Review*, Vol.38, pp-327-34.

Baqee, A. M. and Ahmad, N. (1990), Rural Markets- A Contact Number Analysis, *The Geographer*, Vol. XXXVII, No.1, pp. 35-40.

Behari, O.P. (1993), Agricultural Marketing Education, Training and Extension in India (Country Paper), *Agricultural Marketing*, Vol. XXXVI, No. 2, pp 49-70.

Bhatia, G.R. (1990), Legal and Administrative Framework for Regulation and Management of Agricultural Produce Markets in India, *Agricultural Marketing*, Vol. XXXIII, No. 1, pp. 14-28.

Bhushan, B. (1994), Agricultural Marketing in India: Structural Weakness and Agenda for Reforms, *Kurukshetra*, Vol.XLIII, No.2, pp.9-13.

Bhuyan, S. (1990), State Intervention in Agricultural Marketing: Is it Necessary, *Agricultural Marketing*, Vol. XXXIII, No. 1, pp. 7-13.

Bogahawatte, C. (1988), Seasonal Variations in Retail and Wholesale Prices of Rice in Colombo Markets, Sri Lanka, *Indian Journal of Agricultural Economics*, Vol.43, No.2, pp-139-147.

Brush, J.E., and Guathier, H.L. (1968), Service Centre and Consumer Price, University of Chicago, Research Paper, 113.

Champa, M (1976), Agricultural Development and Role of Fertilizers, *Indian Journal of Regional Science,* Vol.9, No. 1&2, P 151.

Chong-Y, L. (1982), The Food Marketing System in China: with particular reference to the Shang-Hai Area, *Journal of Rural Development*, 5, pp.91-107.

Datta, T.K. (1994), Impact of Seasonality on Market Efficiency of Agri-Produce, *Agricultural Situation in India*, Vol.XLIX, No.7, pp. 509-515.

Deshpande, C.D. (1941), Market Village and Periodic Fairs of Bombay, *Indian Geographical Journal*, Vol. 16, pp. 327-39.

Dixit, R.S. (1980), Market Synchronization: The Case of the Bundelkhand of the Umland of Kanpur Metropolis, *The Indian Geographical Journal*, Vol. 55, No.1 and 2, pp. 58-61.

Dixit, R.S. (2001), Analysis of Spatial Distribution of Regulated Agricultural Markets, *Geographical Review of India*, Vol. 63, No. 2, pp. 141-152.

Dixit, R.S. (2001), Statistical Distribution and Pattern of Spatial Distribution of Regulated Agricultural Markets of U.P., *The Deccan Geographer*, Vol. 39, No. 2, pp. 13-26.

Eigmy, T.H. (1972), Rural Periodic Markets and the Extension of an Urban System, A West Nigerian Example, *Economic Geography*, Vol. 48, pp. 299-315.

Eswarappa. (1991), Market Complex in Bangalore City: A Story of Success and Failure, *The Indian Geographical Journal*, Vol. 66, No. 1 pp. 59-62.

Gabre, M. (2001), The Role of Intermediaries in Enhancing Market Efficiency in the Ethiopian Grain Market, *Agricultural Economics*, Michigan

Ghosh, S. (1993), Report on the Consultative Committee on Agricultural Marketing, *Agricultural Marketing*, Vol. XXXV, No. 4, pp. 33-38.

Goel, V .(2000), A Study of Market Arrivals and Procurement Pattern of Wheat by Public and Private Agencies in Punjab, *Indian Journal of Regional Science*, Vol.XXXII, No.2, pp.94-102.

Harris, B. (1974), The Role of Punjab Wheat Markets as Growth Centres, *Geographical Journal*, Vol. 140, pp. 52-71.

Harriss, B. (1980), Regulated Food Grain Markets, A Critique Social Scientist, VIII, March 8, pp. 22–31.

Hay, A.M. (1977), Notes of Economic Basis for Periodic Marketing in Developing Countries, *Geographical Analysis*, Vol. 3, pp. 72-79.

Hill, P. (1967), Markets in Africa, Journal of Modern African Studies, Vol. 1 pp. 445-453.

Hodder, B.W. (1965), Distribution of Markets in Yarubaland, *Scottish Geographical Magazine*, Vol. 81. pp. 48-58.

Huang, J. and Bouis, H. (2001), Structural Changes in the Demand for Food in Asia, *Agricultural Economics*, Michigan.

Jana, M.M.(1978), Hierarchy of Market Centres in Sabarmati Bana, *Geographical Review of India*, 40, pp. 164-174.

Jones, W. D. (1970), Measuring the Effectiveness of Agricultural Marketing in Contribution of Economic Development: Some African Examples, *Food Research Institute Studies*, Vol.9, No.3, pp.175-96.

Jones, W. D. (1974), Regional Analysis and Agricultural Marketing in Tropical Africa: Concepts and Experience. Food Research Institute Studies, Vol.13, p.3-28.

Kanwar, J.S (1970), The Role of Machinery in Modernization of Agriculture, *Indian Farming*, Vol.XIX, No.11.

Katre, R.S et al (1993), Trends and Variability in the Prices and Arrivals of Rice in Selected Markets of Maharashtra State, *Agricultural Situation in India,* Vol.XLVIII, No.2, pp.67-70.

Khan, N. (1988), Direct Marketing in Agriculture in Faizabad District, *The Geographer*, Vol.XXXV, No.2, pp.68-79.

Khan, N. (1991), Synchronization of Periodic Markets in Faizabad District, North India, *Philippine Geographical Journal*, Vol. 35, No.1 pp. 13-26.

Khan, N. and Ali, A. (1998), Periodic Markets and Rural Transformation in Gonda District, U.P. India, The American Geographical Society, *Focus*, Vol. 45, No. 1 pp. 34-37.

Khan, N. Shrivastava, V.K. and Ali A. (1999) Study of Itinerant Trading System in North India: A Case Study, *Asian Profile*, Vol. 27, No. 6, pp. 511-520.

Krishnan, V. (1932), A Retail Markets Potential Model, *Journal of the American Institute of Planners*, Vol. 31, pp. 134-43.

Kumar, A. (1989), Spatio-Temporal Variations and Determinants of Rice Cultivation in Bihar, *Agricultural Situation in India*, Vol.XLIV, No-3, pp.181-187.

Kumar,R. et al. (2000), Determinants of Prices of Agricultural Commodities in the Regulated Markets of Andhra Pradesh, *Agricultural Marketing*, Vol. XLIII, No. 1, p. 19.

Kumarswamy, S (1969), Expending Role of Cooperative in Agriculture, *Agricultural Situation in India*, Vol. XXIV, No.3.

Mahalingam, S.(1990), Co-operative Approach for Effective Marketing, Distribution and Post Harvest Handling- A Case Study in Salem District of Tamil Nadu, *Agricultural Marketing*, Vol. XXXII, No. 4, pp. 34-39.

Maheshwari, A. (1993), Market Fragmentation and Market Sharing in Wholesale Trade Centres in Karnatka, *Indian Journal of Agricultural Economics*, Vol.48, No.4, pp-658-666.

Malathy, D. (1999), Employment and Earnings of Men and Women in the Scientific and Labour Market in India, *Manpower Journal,* Vol. XXXV, No. 1, p. 13.

Mathur, V.S. (1941), Agricultural Marketing in Western United Province, *Indian Geographical Journal*, Vol. 16. pp. 9-13.

Millor, J.W. (1968), The Function of Agricultural Press in Economic Development, *Indian Journal of Agricultural Economics*, 23 (1).

Mirchandani, R.T. and Hiranandani, G.T. (1963), Regulated Markets: Their Review and Impact on Market Structure and Efficiency- Seminar on Marketing of Agricultural Commodities, *Indian Society of Agricultural Economics*, Bombay.

Mishra, S and Routray. (1995), Role of Market Towns in the Delhi Metropolitan Region-A Case Study of "Palwal", Haryana, *Asian Profile*, Vol,23, No.4, pp-329-348.

Mukerjee, A.B. (1954), The Bi-weekly Market at Modinagar, *Indian Geographer*, Vol. 2, pp. 271-93.

Mundar, R. (1999), Agricultural Marketing Issues and Challenges, *Agricultural Marketing*, Vol. XLI, NO. 4, p. 24.

Nahatkar, S.B., Sharma, H.Q. and Chauhan, R.S. (1999), Analysis of Market Arrivals and Prices of Wheat in Sehore Regulated Markets of Madhya Pradesh, *Agricultural Marketing*, Vol. XLI, No. 4, p.5.

Patnaik, K.U.S. (1987), Groundnut Farm Economy in Alternative Market Channels, *Indian Journal of Agricultural Economics*, Vol.42, No.4, pp-595-603.

Patnaik, N. (1953), Study of the Weekly Market of Barpali, *Geographical Review of India*, Vol. 15, No. 1, pp. 19-31.

Pawar, C.T. and Lokhande, T.N. (2000), Spatial Distribution of Market Centres in Kolhapur District Maharashtra, *Geographical Review of India*, Vol. 62, No. 1. pp. 59-71.

Prasad, J. (1994), Emerging Issues of Agricultural Marketing in Bihar, Kurukshetra, Vol.XLIII, No.2, pp.27-30.

Rahman, S and Routray, J.K (2000),Regional Variation in Agricultural Development in Bangladesh and Policy Implications, *Indian Journal of Regional Science,* Vol.XXXII, No.1, pp.1-13

Raju, V.T. and Lakshmi, K. (1999), Performance of Regulated Markets in Andhra Pradesh, *Agricultural Marketing*, Vol. XLI, No. 4, p. 21.

Rao, S.K (1971), Inter Regional Variations in Agricultural Growth, *Economic and Political Weekly*, Vol .VI, No.27.

Ravi, K.N. et al. (2000), Growth and Development of Regulated Markets in Haryana, *Indian Journal of Agricultural Marketing,* Vol. 14, No. 3, p. 25.

Ravikumar, K.X. et al. (1999), Performance of Market Intermediaries in Aduni Regulated Market of Kurnool District (A.P.). *Agricultural Marketing*, Vol. XLII, p. 36.

Ray, D.M., (1967), Cultural Differences in Consumer Travel Behaviour in Eastern Ontario, *Canadian Geographer*, Vol. 11, pp. 134-156.

Satyanarayana, (1984), Small Farmers in Product Market, *Kurukshetra*, 13 (2)

Shafi, M (1981), Increasing our Agricultural Production, *The Geographer*, Vol. 28, No.1, pp.1-8.

Shafiqullah (1999), Levels of Agricultural development in Gonda District, U.P., *Geographical Review of India*, Vol. 61, No.4, pp.361-371

Shah, N.R. (1997), Emerging Problems of Agricultural Marketing- A Case Study of Mustard in Gujarat, *Agricultural Situation in India,* Vol. LIV, No. 5, p. 247.

Sharanesh, S. Handigamur and Kunnal, L.B. (1999), An Analysis of Arrivals and Prices of Chickpea in Regulated Markets of Karnataka, *Agricultural Marketing*, Vol. XLII, No. 3, p. 41.

Sharma, S.K and Singh, D (2003), Spatio-Temporal Trend of Marketing of Agricultural Produce in Madhya Pradesh, *The Geographer*, Vol.49, No.1, pp.74-85

Sharma, J.L (2004), An Analysis of Operational Farm Size vis-à-vis Economic Efficiency, *Agricultural Situation in India*, Vol. LXI, No.4, pp. 189-190.

Siddiqui, Z, Nizamuudin, K and Hoda.M (2003), Impact of Regulated Markets on Vegetable Cultivation in North India: A Case Study, *The Geographer,* Vol.49, No.1,pp 100-107

Singh, A.L. and Fazal, S.(1993), Farmers Decision Making Process in Traditional Versus Commercial Farming: A Case Study of Upper Ganga-Yamuna Doab, *The Geographer*, Vol. XL, No. 2, pp. 1-20.

Singh, A.L. and Fazal, S. (1994). Marketing of Agricultural Produce by the Farmers in Upper Ganga Yamuna Doab Region India, *The Geographer*, Vol. XLI, No. 1, pp. 1-12.

Singh, B.P. and Tiwari R. (2003), Farmers Development Through Information Technology, *Yojana*, Vol. 47, No. 5, pp. 44-48.

Singh, C and Mathur, V.C. (1994), Growth and Instability in the Production and Price of Potato in India, *Agricultural Situation in India*, Vol.XLIX, No-7, pp.429-436.

Skinner, G.W. (1965). Marketing and Social Structure in Rural China, *Journal of Asian Studies*, Vol. 24. pp. 3-45.

Smith,V.A.(1975), Marketing Agricultural Commodities in Pichincha Province, Ecuador, *Geographical Review*, Vol.65, pp.353-63.

Srivastava, V.K (1984), Progress of Marketing Geography in India, *Indian Journal of Marketing Geography*, Vol. 2, (1-2)

Srivastava, V.K. (1981), Agricultural Marketing in Uttar Pradesh, *Uttar Bharat Bhoogol Patrika*, Vol.16, No.2, pp.117-126.

Subrahmanyam, K.V. (1986), Post-harvest Loses in Horticultural Crops: An Appraisal, *Agricultural Situation in India*, Vol.XLI, No.5, pp.339-343.

Sukhsanjam, Chahal, S.S. and Toor, T.S. (2000), An Impact of Market Regulation on Adequacy of Market Infrastructure in Punjab, *Indian Journal of Agricultural Marketing*, Vol. 14, No. 3, p. 18.

Symnaski, R. (1974), Complex Periodic Market Cycle, *Annals of Association of American Geographers*, Vol. 64, pp. 203-213.

Tewari, S.C et al (1987), Economic Status of Marginal and Small Farmers- A Case Study of Kawal Catchment Area of Himachal Pradesh, *Agricultural Situation in India*, Vol.XLII, No.9, pp.793-799.

Thorpe, D. and Nader, G.A. (1967), Costumer Movement and Shopping Centre Structure: A Study of Central Place System in Northern Durban, *Regional Studies*, Vol. 1, pp. 173-191.

Vaikunthe, L.D. (2000), Regulatory Framework, for Agricultural Marketing- A Case Study of APMCS in Karnataka, *Indian Journal of Agricultural Marketing*, Vol. 14, No. 3, p. 1.

Wayne, M.(1972), The Periodic Market System in North Eastern Ghana, *Economic Geography*, 40, pp.333-344.

Wernerheim, M. C. and Sharpe, A. C. (1999), Producer Services and the "Mixed-Market" Problem: Some Empirical Evidence, *Area*, Vol. 31, No. 2, pp. 123-140.

Yadav, R.N (1988), Marketing of Summer Vegetables at Kanpur: A Case Study, *Indian Farming*, Vol. XXXVIII, No.1, pp-31-35